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Fields for Investigating Waste Elimination

When By-Products Cease to Exist—What Has Been Attempted in Coke Oven and Blast Furnace Operation

BY A. THAU*

INCREASING efficiency of industrial plants in general has been the cause of a reduction of prices for their main products in order to meet keen competition, and to be able to hold a foot on the market many works, if not most, have been compelled not only to adopt the most efficient labor saving methods but also to compensate for a lower selling price by obtaining all possible by-products. With this state of affairs the by-product has ceased to be the source of a huge revenue without investment and there are numerous works which without their revenue being supplemented by a substantial income from their by-product plants would financially be unable to exist. Once such a stage has been reached—and we are approaching it rapidly almost everywhere—then the by-products have ceased to be by-products, their plants are part and parcel of the works and as a source of revenue in supporting the works they are fully qualified products.

Pig Iron as By-Product of Blast Furnace

I visited some time ago a modernly equipped one unit blast furnace plant in Germany making foundry pig iron and inquiring as to the financial results I was informed that they were doing very well, but compelled to sell the iron at a loss. This answer was first a paradox to me but on further investigation I was told that they made their profits—and good ones at that—mainly from the slag which, depending upon its composition, was in attached plants converted into cement, bricks or slag wool. A further revenue to the blast furnace rested also with the credit it derived from supplying with its surplus gas an adjacent rolling mill.

Surely slag and gas cannot be classed as by-products in this not by any means isolated case, and if a distinction between product and by-product must be made, one would in this case certainly be justified in giving the pig iron the name of by-product. Of course, a blast furnace plant is not put down to produce slag; the iron must always be of primary importance in the working, but on the other hand of paramount importance is the assurance of a reasonable revenue which the plant must give. If it cannot be assured without the aid of other products, then we would not do them justice in calling them or treating them as by-products.

But it is certainly not my intention—as it may appear—to spill ink over the word by in this combination, for it doesn't matter how we call the products as long as they are obtained at a profit and increase the revenue of the works. What I am really driving at is that in the first place—when a plant is laid out or worked—they must not be treated and considered as by-products, but must be of quite equal importance to the other products for which the plant is actually laid out. As a matter of fact in some processes the main product and the by-product are not only considered of equal importance but have even exchanged places.

Cases from Industrial Chemistry Field

It serves as a useful lesson to be reminded of the first soda manufacturing process by Leblanc in France from common salt. It was greatly hampered by the unwelcome hydrochloric acid, the formation of which could not be avoided and it was equally difficult to dispose of it. The value of the great discovery was not realized in France at the time when politics were of primary importance absorbing every other interest, and Leblanc was allowed to die in the poorhouse. The process was greatly developed in England, where the chlorine gas was considered an absolute waste and allowed to escape in the air. It became gradually such a nuisance and so detrimental to health that the alkali act of 1863 had to be passed to put a stop to it, compelling the soda manufacturers to condense the chlorine gas, allowing only a maximum of 5 per cent to escape into the air as permissible waste. Soon after the demand for the by-products, hydrochloric acid and chloride of calcium, exceeded that of the soda, which became then of secondary importance, so that for a time the picture was reversed and plants were put down, first of all to produce hydrochloric acid and calcium chloride.

A more recent example is also of interest. The chemical works of F. Bayer in Germany produced an intermediate compound in the manufacture of dyes called acetaniline. In the manufacture of this compound a residue was precipitated which could in the first place not even be called a by-product and was stored as waste in old paraffin casks in the yard of the works, gradually approaching a bulk of 20 tons while no use could apparently be found for it. At that time a young chemist came to spend his university vacation at the works' laboratories and in answer to his inquiry for some research work was requested to transfer the aforementioned waste product into something useful if possible. After a few weeks of intense work the goal was reached and one of the now widely applied compounds in medicine had been discovered, which was soon put on a manufacturing basis, namely, the effective antipyretic, the acetyl salicylic acid, which

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under trade names like aspirin and others has found its way in the households and dispensaries almost over the whole world. A more striking example of the value of apparent waste and by-products could hardly be found.

How Coke Oven By-Product Recovery Began

The development of the by-product recovery in all kinds of industry formerly made very slow progress; nearly everybody used to consider the by-product plants as an experiment with unassured returns. The by-product coke oven builders in Germany some 30 years ago used to overcome this prejudice in a very effective way, and it is due to their methods that the by-product coke oven replaced the non-by-product ovens entirely on the European continent many years ago, and thus enabled the technical and scientific development which was naturally to follow.

They induced the coke producer to allow them to build free of charge a by-product plant in connection with the new coke ovens, and allow them to treat the gases for the recovery of the by-products for a period on the average of 12 years. The builders handed the plant over free of charge to the coke producer after the stated time had elapsed. Such contracts left no risk to the coke producer and to these methods the early development of by-product coking must solely be attributed.

Since then the coke producer has learned that there were no risks and that by the present of a 12 years old by-product plant, after the best times of the ovens are over, he is somewhat out of pocket, while the builders had done very well indeed. Such builders are unable nowadays to place contracts on such terms, as much as they would like to, though they would, I presume, agree to reduce the above-mentioned time to recover the by-products on their own account by nearly half if not more. Still in recent years benzol plants have been built on this basis in England and Belgium and the builder takes the benzol products and runs the plant for a period of generally four years. A benzol plant with its few moving parts should, of course, be as good as new after four years running, but I maintain that if it pays the builders—and they come generally very well out of it—to run the plant for four years, it would certainly pay the producer to do so, even if he had to borrow the money to invest in the plant.

Benzol to Be No Longer a By-Product

My objection against the word by-product rests with the fact that it is often too much regarded and treated as such. Who, for instance, has not experienced that a coking plant is put down with provisions to recover tar and ammonia only. Suggestions as to the building of a benzol plant were negatived and ruled out by the fact that the benzol prices were too low at the time, its recovery did not pay and the addition of a benzol plant could be made later on at any time. Then suddenly benzol prices increased and a benzol plant would be ordered in a hurry, but in the meantime an amount of money had been lost by leaving the benzol in the gas all that time which would have paid for the plant over and over again. During the war every coking plant as well as large gas works on the European Continent and in England were compelled by the respective governments to put down benzol plants, and it paid them very well after disregarding this source of income for many years before.

When the building of a coking plant is contemplated it must be kept in mind that this plant has to produce coke, tar, ammonia, benzol and gas; they must in proper proportion be taken as all of equal value.

The same applies to a new blast furnace plant. As the iron market is taken into consideration so should proper provision be made to utilize the slag and the gas in some economic way, as difficult a problem as this may look at first. And, remember, one should recover all the products first of all when the whole plant is new, because then the best return is obtained, a fact which of course does not speak against providing old plants for additional recovery and so bringing them up to date and in a better state of being able to compete.

Then there is the heat wasted in the slag of blast furnaces and in steel works and the oven heat rendered useless by quenching the coke leaving the ovens. Full use is made in large plants now of the heat of the liquid iron, which is not allowed to cool before it is converted into a finished product. The present coal shortage has given a new impetus to investigate these heat sources and put them to useful account.

Heat of Discharged Coke for Steam Making

On the European Continent a company has been formed, subsidized from the large electrical firm of Siemens, to develop the practical use of this "waste" heat. The idea is to bring the hot coke or the liquid slag in contact with water jacketed receptacles in which the jacketed space is occupied by water at so high a pressure that the formation of steam is prevented. After the water has taken up all the recoverable heat, it is transferred through a pressure reducing valve into a boiler in which the pressure is so much lower compared with that of the jacket, that the heat of the water will be liberated in the form of steam.

This original proposal has, however, been superseded by a perhaps less efficient but safer method, since in a case of leakage the pressure in the jacket would be reduced, causing the formation of steam and by the heat of the slag or the coke, the water jacket would be overheated on the part holding steam instead of water and a serious explosion would probably be the result. Thus it is proposed now to fill the jacket of the receptacle with a liquid of high boiling point, such as, for instance, anthracene oil (having a boiling point of 350 deg. C. = 662 deg. Fahr.) and circulate the oil through a heat exchanging coil or element placed in an adjacent boiler and so convert the heat first of all into steam. Though these trials have hardly got over the preliminary stages yet, it should be an inducement to test similar promising ideas with a view of eliminating the last waste from the works.

Putting Incandescent Coke into Blast Furnace

A frequent suggestion has been to push the coke into an insulated iron receptacle of oven shape, to hoist it up the blast furnace and empty the hot coke into the bell. It has also been proposed to arrange the coke ovens like the spokes of a wheel around the top of the blast furnace and push the coke directly into the bell. The heat economy thus obtained would benefit the blast furnace, but the vital question is whether the blast furnace would really benefit by it, or whether its top would get too hot thereby, and so the apparent gain turn out as a loss after all.

Except this last proposal all engineers and inventors who tried to tackle this problem—myself not excluded—are working in the same direction, that is, by converting the heat of the coke into steam in a chamber with water jacket, before the coke is finally quenched. It would of course be much easier and simpler to use the steam developed by the application of the quenching water direct and there are no technical difficulties in the way of doing so, as far as the recovery goes, and numerous trials have been made in this direction, but it has been repeatedly proved that the steam accumulated by these means is so contaminated with very fine particles of coke dust, sulphuric and sulphurous acid that the turbine blades could not withstand a mechanical emery-like grinding and a chemical etching action at the same time, even for a comparative-

ly very short period. The trials in this direction have proved altogether unsuccessful.

A Coke Quenching Machine

A coke quenching machine has been put on the market in England by Wellington of London recently, being the first of its kind with a water jacketed oven shaped receptacle and steam collector on top, which I consider workable. It is driven by a steam engine, fed from the generated steam and thus self propelling. The engine can be coupled with a dynamo and use up the surplus steam by converting it into electricity, which by trolley collectors and overhead wires is fed into the distribution system. However, with bringing out such arrangements, though they may appear workable, the problem is not solved by any means.

All arrangements so far suggested to recover the heat from coke before or while quenching have this in common that they cause such a loss of time that the treatment of the coke appears to be quite of no, or at its best, secondary importance. That it is futile to recover the heat and at the same time hamper the work of a whole coke oven battery need hardly be explained, and it will be understood that the radiation of the heat through a boiler plate must be expected to take up much more time than the transmission to the directly applied water while quenching, which takes place instantaneously. In recovering steam indirectly from coke not only is a certain time taken up for the transmission of the heat, but the coke cannot be cooled altogether within a reasonable time without the direct application of water, so that the work and time required for quenching must be counted on top of the preliminary combined cooling and heat recovery process, quite apart from the labor which supervision, steam and water connection may involve. It naturally follows that much has to be tried and experimented yet in this field until the chain of products can be closed, thereby eliminating all waste.

Utilizing Fully the Gas Power

In the recovery of power as a by-product there is nearly always a discrepancy between supply and demand at different hours, days and seasons. Take, for instance, a blast furnace or a coke oven plant supplying surplus gas to a rolling mill or to a large central power station. Leaving Sundays and holidays as well as unforeseen stoppages out of consideration, it would be difficult to compensate for the reduced consumption even during meal times by providing sufficient storage room for the gas.

What naturally suggests itself as the most adaptable compensator in this connection is an electric accumulator, but with the little progress that has really been made in the construction of electric accumulators, it would require such huge proportions and such an enormous capital that together with its upkeep it could not be expected to yield a satisfactory return and a city of very large gas holders would economically as well as practicably be preferable and efficient by storing the power in form of gas instead of electricity.

The firm mentioned proposes to keep within limits an even load on power stations and compensate for the unconsumed power by leading the current into similar water tanks of the special design mentioned, by means of electrodes and storing the surplus energy in the form of heat which by reducing the pressure can be converted into steam to drive power generating steam turbines as soon as the load exceeds the available power obtainable from the regular gas supply. How far this proposal has been put to the practical test and with what results, I have not so far been able to ascertain.

Similar conditions, as stated above, exist in a power station in the south of Germany driven by water turbines which during a number of hours on weekdays are loaded to their utmost capacity. As soon as the load slacks off considerably, large centrifugal pumps are started which supply water to a high level storage tank from which it is taken during the hours of need as a supplementary water supply to the turbines. The efficiency is, however, low, and if I have been correctly informed, not much over 30 per cent. Though I presume that the efficiency of the aforementioned arrangement to store surplus power in the form of heat will not be much higher, it must still be considered better than waste with no efficiency at all, if the upkeep and the capital outlay of the arrangement do not prove to be prohibitively high.

Utilizing Carbon Dioxide from Chimneys

Before concluding my remarks about waste of recoverable revenue on modern plants, I must draw attention to a source of waste which terming it as such sounds somewhat paradoxical and has generally escaped notice. I mean the carbon dioxide leaving our chimney stacks. Every engineer who has got the faintest idea of combustion is alive to the fact that his efforts must be directed to obtain as high a percentage of carbon dioxide in the flue gases as possible. So as a sign of perfect combustion, it is not altogether waste to let it pass to the chimney. Everybody knows that CO_2 is absorbed by the microscopically small pores with which every green leaf in vegetable life is provided and that by the chlorophyll, the green substance of the plants, it is converted into starch and other plant foods.

It happened in Germany that the owners of a large iron works got tired of being compelled to pay to the surrounding farms annually substantial sums as compensation on the ground that the gases escaping the chimney stacks of the works decreased the fertility of the land. Based upon the above-mentioned fact that CO_2 is actually plant food and certainly does not do harm to growing vegetation, the gases from a blast stove chimney were circulated through a large greenhouse and later on extensive trials were carried out in conducting these gases over open planted fields. There it was plainly proved that the gases did not only do no harm whatever to vegetable life, but that in comparison to other equally planted fields the growth of the vegetation was considerably accelerated by the effect of the CO_2. These trials have been continued and the gases rich in carbon dioxide have been rapidly taken up as a fertilizer by suitable arrangements.

In passing a refuse heap or any other source of waste on the works, one should keep in mind the history of the Leblanc process and of the acetyl salicylic acid manufacture. Naturally, many works owners or leaders are not easily induced to spend capital over trials and investigations of doubtful result, which even with success may not only benefit the individual works which accomplished their introduction as a useful product at perhaps tremendous costs, but may also eventually become common property. To ask private enterprise to spend money over processes by which in all probability also his competitors would benefit at very little expense to themselves, seems at the first sight to be an Utopian idea. But if one considers that one has probably not a machine, an apparatus, an arrangement of some kind in the works for which in its origination or perfection somebody, mostly unknown or forgotten to us had to pay, even if not so heavily as Leblanc, then the idea to follow up any suggestion with even a small prospect of personal success to cut out waste will cease to be a Utopia to the open mind.

There is a great probability of a general strike at the plant of the Canadian Vickers, Ltd., Montreal, Que. Some time ago the men presented a demand for 90 cents an hour, which the company refused, offering 80 cents. The men have now presented a final demand for 85 cents, and failing the granting of this a strike will be called.

OPPOSE PROFITS TAX

Business Men Want Change in Revenue Laws—Meeting Held in Chicago

Federal revenue laws and, particularly the excess profits tax, are responsible in large measure for the present period of high prices, in the opinion of business leaders who attended the meeting of the National Industrial Conference Board at the Blackstone Hotel, Chicago, on April 15 and 16. To the end that something constructive and sound may be done to remedy the situation, a committee of 16 members was organized which, with the assistance of a staff of tax experts, will study the problem carefully before making its recommendations. In a strict sense, the committee is not an Industrial Conference Board body. In fact, it contains a majority of members representing outside interests and will be enlarged if other branches of industry choose to co-operate in the work undertaken. The committee is working under the auspices of the Conference Board, merely because it preferred to operate through the machinery of an established organization. Its aim, however, is to make its study of nation-wide scope and representative of the views of all business interests.

Some of the members are James A. Emery, counsel, National Association of Manufacturers, Washington; Fayette R. Plumb, president, Fayette R. Plumb, Inc., Philadelphia; Wilson Compton, secretary, Lumber Manufacturers' Association, Chicago; Harry H. Smith, Mid-Continent Gas and Oil Association, Tulsa, Okla.; Fred W. Lehmann, Jr., Western Petroleum Refiners' Association, Kansas City; C. B. Heinemann, representing the live stock interests, Chicago; Paul Armitage, American Mining Congress, New York; Rush Butler, representing the coal mining operators, Washington; R. C. Allen, Cleveland, for the iron and steel industry; L. F. Loree, president, the Delaware & Hudson Railroad, for the railroads and public utilities.

Mr. Emery, in discussing the excess profits tax at the Chicago meeting, stated that taxes should be based on money spent and not on money saved. The excess profits tax, he said, was not only an expensive method of obtaining revenue, but discriminated against businesses involving great risk. Some new method of taxation, such as a sales tax, should be substituted.

Judge Zoeller, tax attorney, the General Electric Co., defended the profits tax as preferable to other plans proposed. The tax, he said, is based on capital invested, a feature which would be ignored by a sales tax. Whereas the profits tax is designed to exact tribute according to ability to pay, this would not be the case with the sales tax, which would apply on like commodities regardless of the profit made. The latter, in his opinion, would result in even higher prices than obtain under the present system. He proposed the abolition of the surtax on individual incomes and the retention of the excess profits tax. In general discussion this plan was attacked on the grounds that it would prove discriminatory against corporations unless applied to partnerships and personal enterprises, which would prove impracticable.

Prof. Carl Plaehn, University of California, discussed the excess profits tax from an academic point of view, pointing out both good and bad features. He stated that the abolition of the tax would not remove the causes of unrest in this country. The Government, he said, had to get revenue from somewhere, and if not through the profits tax, through some other agency.

The meeting of the National Industrial Conference Board was the first to be held at Chicago, in fact, the first to be held outside of New York and Boston. It was called in the Middle West for the purpose of giving business men in that section an idea of the nature of the organization and the scope of its work. Representative men from Chicago, St. Louis, Detroit, Cleveland, Milwaukee, and other cities were present. The attendance was 125. All sessions, except the one dealing with taxation, were closed to the public.

Industrial Exhibition at Brooklyn

The third annual industrial exhibition at Brooklyn, N. Y., held in the Twenty-third Regiment Armory, April 10 to 17, surpassed the preceding exhibitions in both the number of exhibitors and in the attendance. The list of exhibitors has grown from 35 in 1918 to 180 at this third event. There were 309 booths, said to be the largest number ever planned on the armory floor. Monday was featured for the Metal Trades Industries Exchange, the principal address being delivered by H. H. Doehler, president Doehler Die Casting Co., Brooklyn, N. Y., and president of the Brooklyn Metal Industries Exchange. F. H. Moses, president Adriance Machine Works, Brooklyn, was chairman of this session and had as associates James Skinner, E. W. Bliss Co., Brooklyn, and Herman Oswald, V. & O. Press Co., Glendale, L. I. Mr. Doehler in his speech explained a plan now being formulated whereby Brooklyn would be exploited through the medium of its industrial exhibits.

Those exhibits with machines in operation proved centers of attraction. E. W. Bliss Co., Brooklyn, displayed an automatic can body machine, double seamer and gang slitter, all in operation; Adriance Machine Works, Brooklyn, exhibited a staggered feed press and a bottling and crowning machine; Eastern Tube & Tool Co., Brooklyn, had drill chucks in operation on a Sipp machine; Ludlum Steel Co., New York, showed a machine boring square holes with drills made from Ludlum steel, and also exhibited tool steels of various brands; Potdevin Machine Co., Brooklyn, had a gumming machine in operation; V. & O. Press Co., Glendale, L. I., displayed a line of presses in operation; Wahlstrom Tool Co., Second Avenue, Brooklyn, exhibited automatic drill chucks and tapping attachments and showed these in use on a Sipp four-spindle drill press; Surface Combustion Co., 366 Girard Avenue, New York, had working an impact type burner with refractory bed illustrating the radiant heat principle, an oven type furnace for heat treating and hardening, and a forge for rod end heating or for drop forgings. Other exhibitors, with the products displayed, included:

Acme Foundry Co., Brooklyn, castings in gray iron and semi-steel; Beach-Russ Co., New York, vacuum pumps and pressure blowers; T. R. Brawley, 85 Adams Street, Brooklyn, felt washers, gaskets and other felt products; Brooklyn Fire Brick Works, 88 Van Dyke Street, Brooklyn, fire brick; Burr & Houston, 84 Calyer Street, gray-iron castings; H. W. Cotton, Inc., Thirty-fifth Street, Brooklyn, bench lathes; Christopher Cunningham Co., 437 Greenpoint Avenue, Brooklyn, steam boilers and pumps; M. T. Davidson Pump Co., 42 Keap Street, Brooklyn, boiler feeds, vacuum pumps and marine ash ejectors; De Haven Mfg. Co., 50 Columbia Heights, Brooklyn, box straps, clutch nails, flexible pail hoops and shipping department specialties; Doehler Die Casting Co., Brooklyn, die castings, brass, aluminum, zinc, tin and lead.

Fairbanks, Morse Co., New York, Anderson vertical tapping machine, small lighting plants for 40 lights, portable diaphragm power pump and Anderson die forming machine; Forbes Tubular Products Corporation, 85 Fulton Street, Brooklyn, tubular products; Fortuna Machine Co., New York, skiving machines; Foster Pump Works, 36 Bridge Street, Brooklyn, motor driven rotary pumps, air compressors of hand and motor driven type and an ammonia pump; Fulton Foundry & Machine Co., 21 Furman Street, Brooklyn, sensitive tapping machines.

General Electric Co., motors; R. Hamilton & Sons, Inc., 56 Water Street, Brooklyn, brass, bronze and aluminum castings; Hay-Budden Mfg. Co., 254 North Henry Street, anvils; Improved Appliance Co., 413 Kent Avenue, Brooklyn, brazing table, multi-tube burners, tank furnace, fan motor blowers, soft metal furnace, and rivet forge; J. D. Johnson Co., Inc., Brooklyn, plumbing supplies and fittings; Abbe Engineering Co., 220 Broadway, New York, pebble mills, laboratory mills and rotary cutters; Oldham New York Saw Works, Inc., 112 Twenty-sixth Street, Brooklyn, 72-in. saw, smaller saws and band saws; Thomas Paulson & Sons, Inc., 97 Second Avenue, Brooklyn, brass, bronze and aluminum castings; the Peelle Co., Stewart Avenue and Harrison Place, Brooklyn, elevator fire doors; Taylor & Co., 680 Morgan Avenue, gray-iron castings; Walworth Mfg. Co., 19 Cliff Street, Brooklyn, valves, fittings and pipe tools; J. H. Williams Co., Brooklyn, drop forgings and drop forged tools; Irving Iron Works Co., Long Island City, N. Y., subway gratings.

Rolling Sheet Brass

Procedure in the Plant of the Bridgeport Brass Co. Illustrated

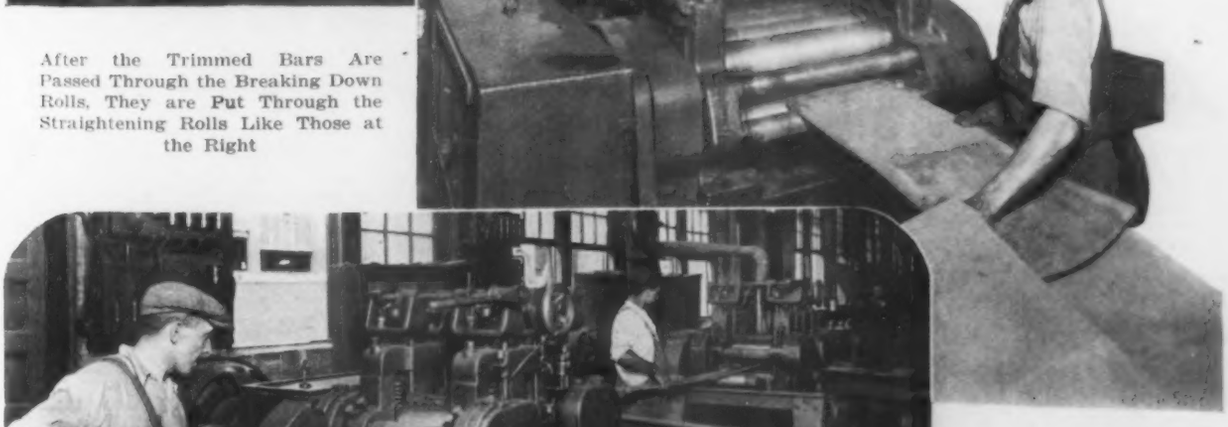
BY OTIS ALLEN KENYON

Fifth of a series of six articles. The fourth having to do with making seamless brass tubes appeared in the issue of April 15. The other parts covering the making of brass were printed in the issues of Feb. 19, March 18 and March 25. The author is engineer of Ray D. Lillibridge, Inc., New York.

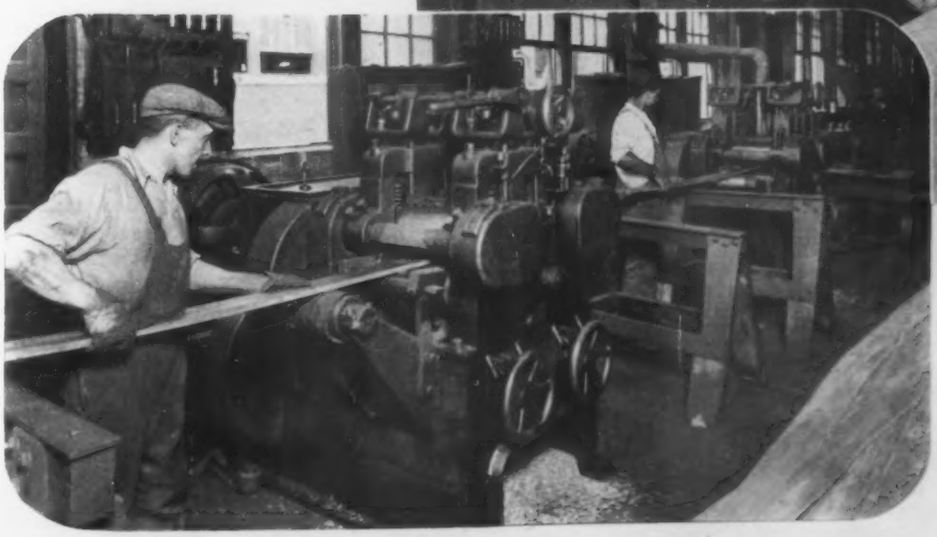
AT the present time the process of rolling brass is the only one which remains practically as much in the hands of the expert operator as it did many years ago. Of course, the process of rolling in a modern mill is more systematically planned and executed nowadays than in former times. Nevertheless, the quality of the product is very largely dependent upon the skill and ability of the man who operates the rolls, and the only way that a uniform product can be assured is by rigid inspection and careful control through the laboratory.

In following the rolling processes through the mill and judging the quality of the product at each step, the microscope is probably the most valuable inspection tool, as the crystals indicate at once to an expert the success or failure of the rolling opera-

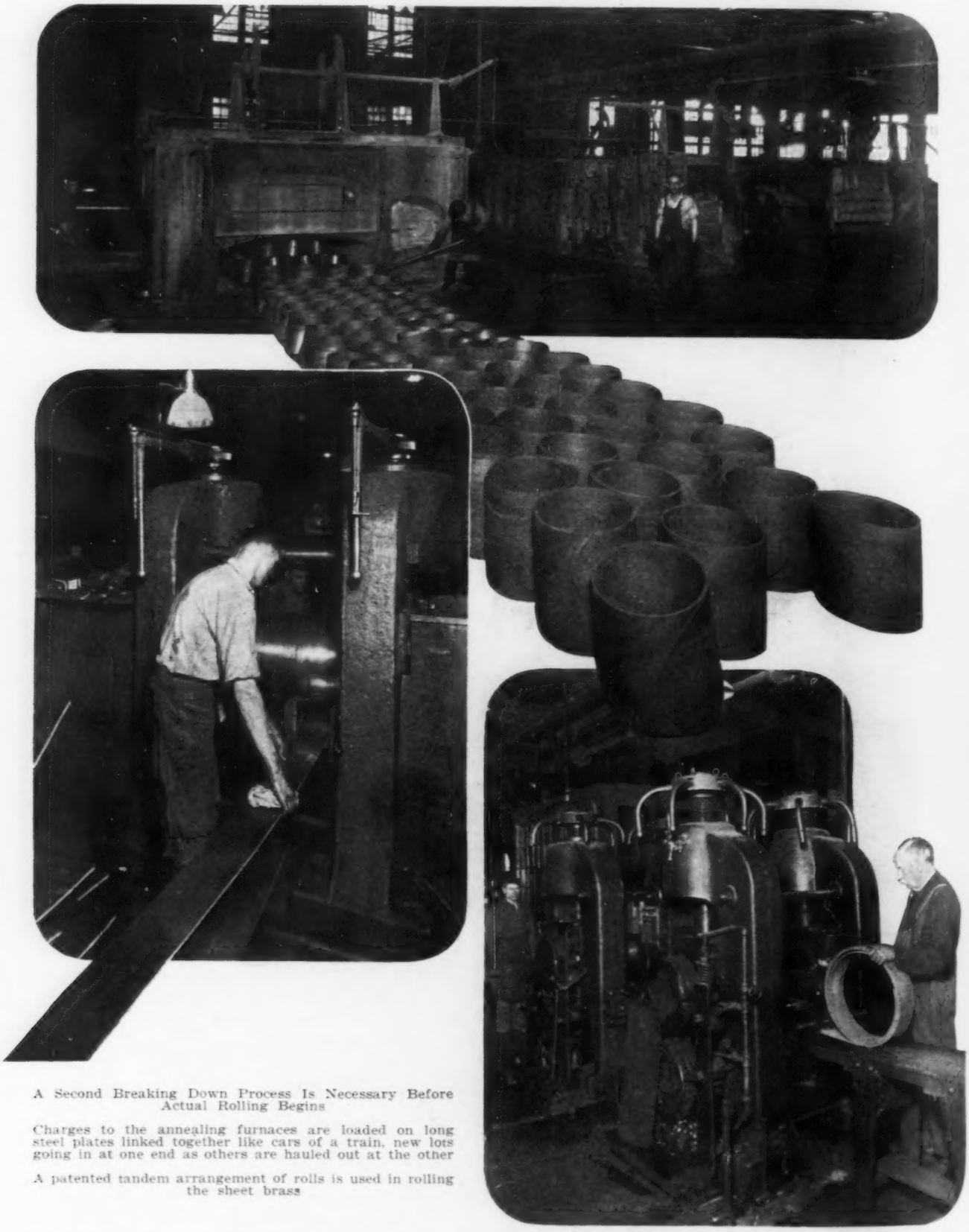
Gates to the Cast Bars Are Cut Off in the Alligator Shear and the Cross-Section Noted for Quality of Metal



After the Trimmed Bars Are Passed Through the Breaking Down Rolls, They are Put Through the Straightening Rolls Like Those at the Right



To Remove Surface Imperfections the Straightened Bars Go Through High-Speed Milling Machines, a Process Superseding Former Mechanical Scraping



A Second Breaking Down Process Is Necessary Before Actual Rolling Begins

Charges to the annealing furnaces are loaded on long steel plates linked together like cars of a train, new lots going in at one end as others are hauled out at the other

A patented tandem arrangement of rolls is used in rolling the sheet brass

tion that has been performed. The operation of making a crystal count is shown in the photograph reproduced at the head of this article.

In the Bridgeport Brass Co.'s plant brass for rolling is cast in long flat slabs known as bars. These bars are delivered from the electric casting shop to the rolling mill, where the gate is cut off in an alligator shear. The man shown at the left in the picture of the shear is an expert in judging the metal by the character of the cut. He examines the cut-off part to determine whether the gate has been completely eliminated or not and to pass upon the quality of the metal.

The trimmed bars are next inserted into a pair of break-down rolls to start the process of mechanically working the material. After breaking down they are passed through a series of straightening rolls. The straightened bars are then passed through high speed milling machines which remove the surface impurities and imperfections. This operation is also shown among the cuts. Formerly the surface impurities were removed by a process of scraping, mechanical fingers being rapidly reciprocated over the surface of the bar, digging into it like a set of finger nails on every other stroke. The milled bars are then passed through the second

breaking-down process, after which the actual rolling begins.

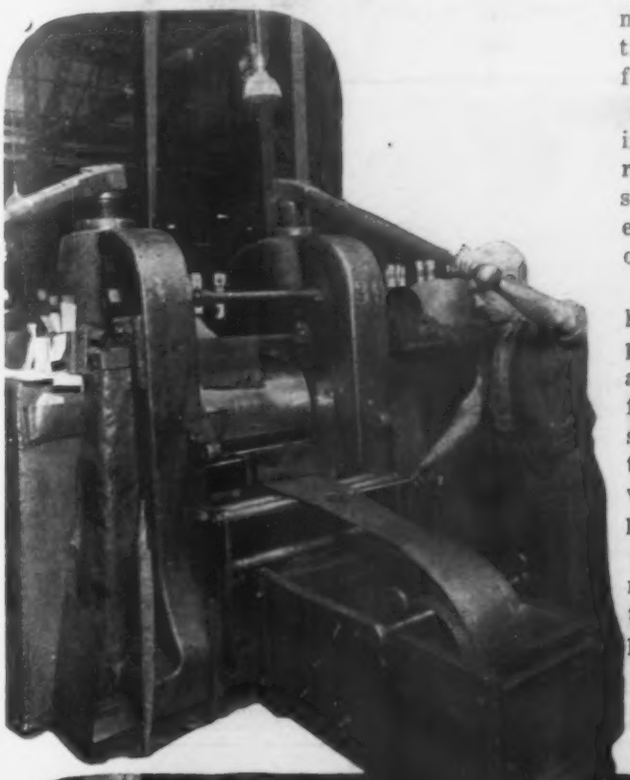
Since mechanical working of brass and copper hardens the metal, it is necessary to anneal the bars at various stages of the process. This is done in large double-end furnaces as shown. The charges of sheet metal are mounted on long steel plates which are provided with rings on each end to permit coupling together, like cars in a train. The annealed metal is drawn out of the furnace by a winch and as the charge is drawn out of one end of the furnace, a new charge is drawn in from the other end—the carrier being coupled to the outgoing charge. One illustration shows the annealed charge in the foreground and the fresh charge inside of the furnace. The difference in the surface appearance of the annealed and unannealed metal is apparent.

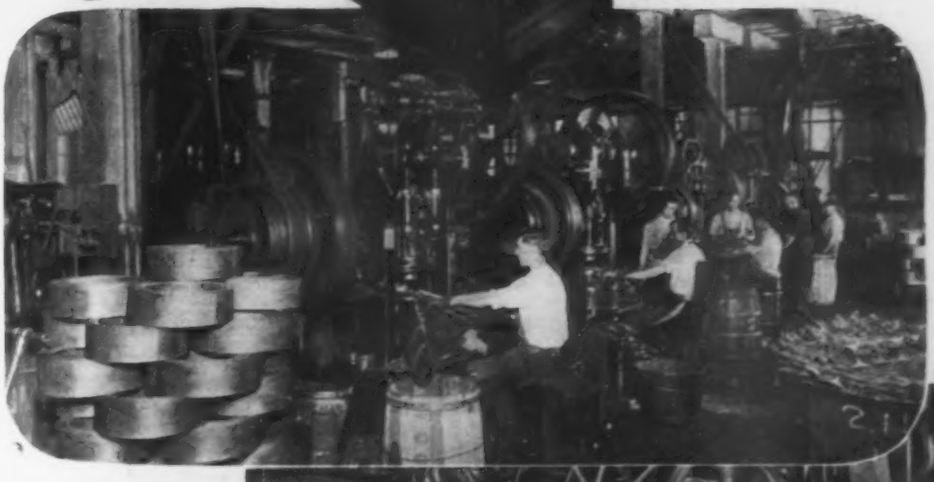
The temperature of these furnaces is accurately controlled by electric pyrometers, facilities being provided for reading the temperature at both ends and in the middle of each furnace. Indicating pyrometers are provided for guidance of the furnacemen and recording pyrometers are provided for furnishing records of the heating conditions at all times, and also for the guidance of operation of the furnaces.

Some years ago the Bridgeport Brass Co. originated and patented the method of using tandem rolls in the production of sheet brass, the rolls being so operated that a definite amount of tension is established in the metal between them. Such a set of rolls is shown in operation.

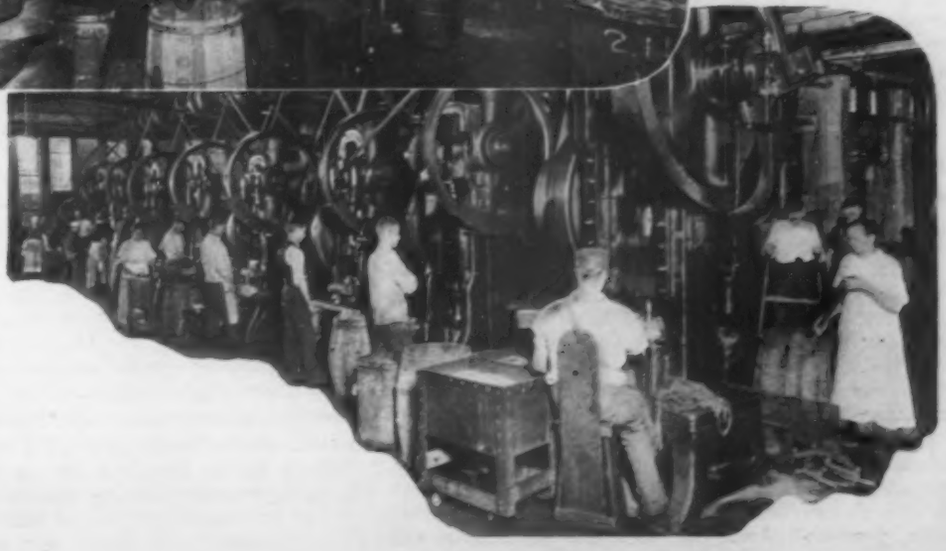
The company recognized the necessity of using highly skilled and experienced men on the most important operations of rolling and has in its employ a number of rollers that have been with the company for more than 30 years. For instance, the roller shown in the view of the tandem rolls has been with the company 38 years, and the one shown in the view of rolling sheet brass has been with the company for 47 years.

A great deal of the sheet brass produced in this mill is used in the manufacturing department of the company where various drawn and stamped products are manufactured.





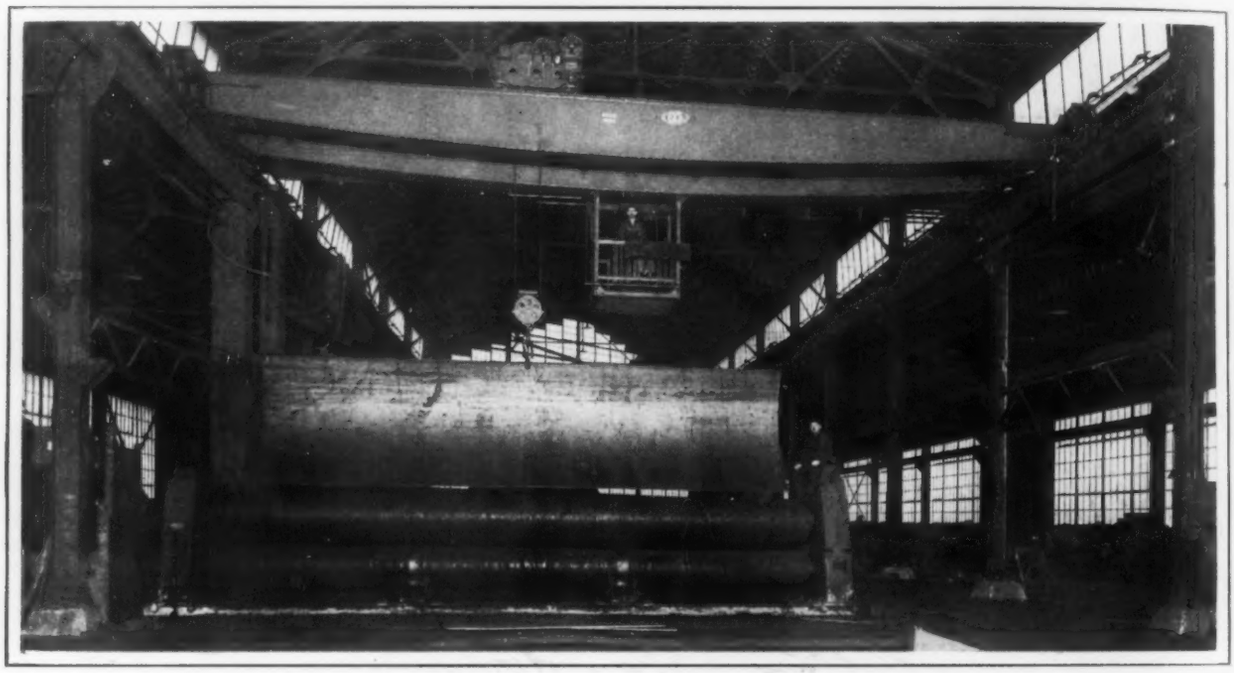
Sheet Brass Is Converted in Part at the Bridgeport Brass Works into Various Articles of Commerce by Means of Punch Presses



Another Illustration of Rolling Sheet Brass Is Given in the Picture at the Top of the Group

Another Large Plate Bending Roll

Here is a plate bending roll made for the Lasker Iron Works, boiler maker and steel plate engineer, Chicago, by Wickes Brothers, Saginaw, Mich. It might well have been included in the article and accompanying table entitled, "Size Comparison of New Bending Rolls," in THE IRON AGE of April 8. The following data give an idea as to size: Distance between housings, 32 ft. 2½ in.; diameter of top roll, 30 ft.; weight of top roll, 50 tons; maximum thickness of plate which can be bent, 1 in.; diameter of the cylinder into which the plate can be bent, 6 ft.; maximum length of rolls, including what is called a counterbalance, 42 ft. After the complete cylinder has been made from the flat plate, the housings can be dropped and the cylinder removed. The roll was forged from the ingot by the American Bridge Co. at its Gary plant. The total weight of the machine is 140 tons.



A Plate Bending Roll of the Lasker Iron Works, Chicago, and a Plate Which It Has Bent

French Mission Coming

WASHINGTON, April 19.—A French naval ordnance and artillery mission, consisting of seven of the most eminent ordnance engineers of the French navy, is due to arrive in New York on May 3. The mission will spend three weeks in the United States visiting various ordnance establishments of the Army and Navy, and industrial plants which are manufacturing ordnance material. The head of the mission is Engineer General First Class Charbonnier, Inspector General of Naval Artillery of France. He is considered the leading ordnance authority in France. The mission will sail May 27 on the steamer Rochambeau for France.

Engineers Meet in Chicago

The governing boards of the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers met in Chicago on April 19 and 20 at the invitation of the Western Society of Engineers to consider the working out of a simple and comprehensive relationship between the national associations and the western body. On the evening of April 19 a dinner was held at Hotel La Salle, presided over by A. Stuart Baldwin, vice-president Illinois Central Railroad and past president of the Western Society. Those scheduled to speak were Arthur P. Davis, president, American Society of Civil Engineers; Herbert Hoover, president American Institute of Mining and Metallurgical Engineers; Fred J. Miller, president American Society of Mechanical Engineers; Calvert Townley, president American Institute of Electrical Engineers.

Engineering Advertisers' Association Opposes Advertising Tax Bill

The bill proposed by C. J. Thompson, representative in Congress, to tax advertising, was discussed at length by the members of the Engineering Advertisers' Association at its monthly meeting at the Great Northern Hotel, Chicago, on April 13, and it was unanimously agreed to enter a vigorous protest against this proposed legislation as being unsound and unfair to business. It was argued that the passing of such a bill would tend to curtail the advertising of some manufacturers, which would cause more or less depression in business, and as the crying need of the hour is for more production, and *more production*, and STILL MORE PRODUCTION, it would be most unwise to interfere with business now by passing the proposed tax bill. The members of the Engineering Advertisers' Association represent about 100 of the leading manufacturers of engineering products in the Middle West.

Making Large Plant Additions

The Canonsburg Steel & Iron Works, Canonsburg, Pa., maker of iron and steel sheets, is making some large additions to its plant. These include one 28 x 48-in., and one 28 x 44-in. hot mills and one 28 x 48-in. roughing mill, also an additional 25-ton electric crane being furnished by Pawling & Harnischfeger, Milwaukee. The hot mills are being built by the Standard Engineering Co., Ellwood City, Pa., which is also furnishing two 156-in. squaring shears, motor driven, and one motor-driven roll lathe. Two steam doublers are being furnished by Hyde Park Foundry & Machine Co., Hyde Park, Pa., and the Fort Pitt Bridge Works, Pittsburgh, has the contract for all the furnace castings. Contracts for the sheet and pair furnaces have not yet been placed, but likely will be in the next two weeks. The company is also adding two Babcock & Wilcox water tube boilers of 400 hp. each. The motive power to be used will be a Hamilton & Corliss engine which the company already has. The gearing is being furnished by the Mesta Machine Co., Pittsburgh. The Fort Pitt Bridge Works also has the contract for a new steel building to cover the two new mills and also four mills in the present plant, an old building to be dismantled. This company will likely buy other equipment soon.

Development of Shop Committees in America

Misunderstandings of Labor and Capital—The Whitley Council in England Not Suitable for This Country, but Has Influence on This Side

BY CHARLES NORRIS MILLS

SHOP committees are passing the period of apprenticeship. Although unheralded and unsung at birth and in the early stages of infancy, within five years they have sprung into a sturdy existence. To-day the shop committee is the slogan of the hour.

Coincident with the development of the shop committee is the spread of "industrial democracy." In fact, "industrial democracy" is rapidly becoming a catch-phrase, in not only our industrial relationships, but also in our social and political life.

The function of the shop committee is not yet clearly recognized by the general public. Capital and labor, too, have often misinterpreted the purpose of the shop committee. While many large corporations have sincerely tried, by investigation and research, to meet fairly the needs which call forth the existence of the shop committee, other employers have thought of the shop committee as a "cure all" for all kinds of industrial troubles. Thoughtlessly and selfishly, they have presented shop committee systems which by the very nature and spirit of their induction are doomed to failure.

There has also been much misunderstanding from the side of labor. Where the shop committee has tended to increase the prestige and strength of the trade union, union leaders have co-operated with the shop committee. On the other hand, where the introduction of the shop committee has resulted in a weakened union influence, there has been much suspicion. "Industrial democracy," too, has been looked upon by many union leaders simply as some new scheme to camouflage the helpless wage-earner—a worthy successor of benevolent despotism and paternalistic welfare schemes.

It is high time for us, representing the much-abused public, not simply to sit on the sidelines as silent spectators but to ask ourselves in a truly dispassionate, scientific attitude of mind just what these catch words mean; whether they are successors of the war slogans like "Food Will Win the War" or "Buy a Bond to Kill the Kaiser," or whether underlying these terms there is substantial bone and sinew for industrial reconstruction. If the public is really to share in the interpretation of the industrial crisis, real shop representation and real industrial democracy must be understood.

In any such research, we are confronted by the large variety of shop committee plans which flood the industrial market of to-day. We have not the time or the patience to discriminate between all the chaff and the wheat in such plans, but we can confine ourselves to a discussion on broad general grounds.

Definitions

Many people regard industrial democracy as a settled state of future blessedness where there shall be no industrial quarreling, no strikes, no lockouts, no industrial guerrilla warfare. They look upon industrial democracy somewhat as the early Christians looked for an actual manifest kingdom of heaven upon the earth. They regard it as something basic, static, an institution, a settled state.

We are not prophets, we cannot tell what the form of industrialism will be 50 or 100 years from now any more than we can know what the form of our political government will be in 2020 A.D. But we can assert that industrial democracy will not be revealed so much in some actual institution or form, but rather in an *attitude* toward certain forms of industrial government. "Industrial democracy" is not an express state to be looked forward to, but rather an *expression* or *attitude of mind*. It represents vision—a certain perspective toward industrial problems both present and future. Inherently, it is broad, liberal, untrammeled. Literally, it attacks the powerhouse of an industrial autocracy which says that some things: wages, hours, conditions of work, etc., are too "sacred" to be discussed. It opens the channels of expression. Being, therefore, an attitude of mind, we can make no set definition of industrial democracy.

In the limits of this discussion we are particularly interested in shop representation, and in industrial democracy only so far as it relates to shop representation. Industrial democracy being considered as a broad, open, sympathetic attitude of mind toward industry and its attendant problems, we find that shop representation is simply one of its manifold forms of expression. Industrial democracy may be termed the mother, shop representation the handmaid. It is the most significant and patent expression in form we have to-day of the outworkings of the spirit of industrial democracy.

Shop representation or shop committee plans express industrial democracy in presenting some internal plan of government in each individual plant by the means of which employees, individually and collectively, may have a direct and authoritative voice in the formulation of such policies as directly affect their physical, moral, social, and economic welfare.

Reasons for Growth and Development in America

The rise of shop committees in America is due to a variety of causes, which may be summarized as follows:

1. A state of mind has been developed by the Great War which declares that since the world has been made safe for democracy, democracy must be made safe for the world—democracy in every relationship of life. The war has turned the spotlight on the closed life of autocratic industrialism and so has brought about the recognition of the right of labor to exercise self-determination in matters which directly concern the wage-earner. Just as our fathers declared that there should be "no taxation without representation," so labor declares to-day no absolute control without representation. As the *Journal of Commerce*, New York (Dec. 10, 1918) declares, "The old standards of the industrial Bourbons are out of date and cannot be maintained or enforced." So, whether we turn to seething Russia with her shifting schemes of Sovietism, or to tired England with her Whitley Council plan, we find the same spirit; the re-emergence of the individual man and the assertion of his fundamental rights, political, social, economic in the expression of democratic principles. Shop committee development is simply the outpouring of this spirit in industry—that every wage-earner should have representation in matters which directly concern his industrial life.

J. D. Rockefeller, Jr., in his Atlantic City address, sounds a warning to those "who refuse to reorganize

their industrial households in the light of the modern spirit, for upon them will rest the responsibility for such radical and drastic measures as may be forced upon industry if the highest interests of all are not shortly considered and dealt with in a spirit of fairness."

2. The fear of the syndicalist doctrine and methods has forced many employers to seek a haven of refuge in the shop committee plan. As Cyrus McCormick, Jr., said at the N. A. E. M. convention at Cleveland, "Employers are seeking to head this off (syndicalism) and provide a saner method by which legitimate desires of the workmen for self-expression can be granted without at the same time completely destroying our present industrial fabric."

3. Beyond the mere inherent right for individual expression in the affairs of industry there is also the moral right which goes far beyond any theoretical democratic right. It says to the world that the days of benevolent despotism are over, that paternalistic welfare schemes and profit-sharing plans to buy off loyalty are things of the past, that conditions of work cannot be superimposed, but rather there must be conference, expression, discussion. The days of the Frederick the Greats, the Machiavellis, and the William the Seconds are over in industry as well as in political life.

This moral right has its foundations in the growing opinion that if capital with monetary investment can control, surely labor with life investment ought to share that control. "Investment in industry is recognized as affording a right to share in corporate control. Capital and management are so entitled, why not labor? . . . The investment of capital is an investment in the nature of substances and material, the investment of labor is an investment in the nature of skill and life. The one is material, the other is human investment. Both, however, are investments, and of the two, the one involving life is the more precious."—(W. L. Mackenzie King. Industry and Humanity, Chap. 10.)

4. The shop committees movement has had phenomenal growth because business has found that it pays. It pays in dollars and cents, in the cutting down of strikes, in reducing obvious industrial cancers. But it also pays in producing something that money can never buy: co-operation, respect, perspective, of the other fellow's point of view, constructive leadership, the spirit of service. It pays because it places absolute worth on those essential, intangible elements which our present day industrial relationship so sadly needs.

Shop Committees and the Whitley Council System

The Whitley Council reports have done much to influence the growth and development of American shop committees. They are extremely valuable in pointing out the basic principles on which shop representation rests, such as the statement that "means for securing for the people a greater share in and responsibility for the determination and observance of the conditions under which their work is carried on is necessary in order to secure the better utilization of the practical knowledge and experience of the work people."

Some of the less informed public, having read the Whitley Council plans, have been led to think that if they could be adopted wholesale throughout the length and breadth of American industry, a way to industrial peace would be assured. But these people fail to discern great fundamental differences which underlie the conditions of British and American industry. They do not appreciate the difference in the atmosphere in the two countries. So while we may agree in the principles of the Whitley Councils and gain much inspiration from them, we cannot apply them broadcast in American industry.

There are several reasons why the Whitley plan is not applicable to our own country. First. *Class consciousness is far more distinct in England.* Class cleavage is sharp and well defined in Great Britain to-day as a result of an inheritance from time immemorial. In England, the average wage-earner realizes that he belongs in a certain class and is likely to remain in that class during the rest of his days. The average British servant or factory worker is an example of this attitude of mind. The servant realizes that there is about as much chance of breaking into the wealthy class as there is of entering the blooded aristocracy. In America there still predominates that idea in the mind of the average wage-earner that he may rise, by stint of hard endeavor, to any heights of prominence or wealth. The schoolboy still has hopes that he may entertain his friends in the White House. The average successful business man has risen from the ranks and his success points the way to the man below. America still seems to be the land of the golden opportunity.

The Whitley Council plan takes cognizance of this class consciousness. It takes the worker as a class and the employer as a class and the two groups together in joint council. The class distinction is dominant. In America we have the employer and the worker together in councils, agreements and discussions, but not as representing different strata of society. In America we all belong to one big organic whole—the people.

Second. In England, one wage-earner in three belongs to a union; here, between one and two workers out of ten are unionized. Great as the growth has been of trade-unionism in the United States during the past years, it has yet to touch the rank and file of American industrialism. The consequence is that in England trade unionism is indicative of all labor; it truly represents all the workers; it is accepted as part of the organic composition of society. It is accepted as an established institution of society on the same level as the church, the school, and the bank. Hence, employers have for many years dealt with unions as an accepted group of people, and it is upon this recognition that the Whitley Council system was made possible.

In America we have yet to bring the union within the pale of established institutions. It is as yet an outsider, untried, unaccepted. Accordingly employers have dealt with unions only when forced to recognize them, and so no universal recognition. Hence, at the present time, due to its ostracized position as an integral part of society, the union causes the failure of the adaptation of the Whitley plan wholesale to the different industries of American business.

Third. England is a small, compact country. Hence, her industrial conditions can be easily standardized and correlated. Her population is homogeneous. Her body politic is fairly well stabilized and unified. Accordingly, the Whitley system is easily adapted and put on an efficient method of procedure. Compactness makes for compliance; geographical propinquity makes for the ease of agreement; unity of national ideals makes for efficient acceptance.

America is a vast country of tremendous distances. Industrial conditions are as variable as the people, North, East, South, West. Industries are per se almost impossible of complete standardization or correlation. The population is heterogenous and cosmopolitan. The body politic is diverse. Accordingly, the Whitley plan, easily adaptable to a small country, compact industrially, easily unified, is impossible of adaptation in any wholesale fashion in the United States. Distance makes for diversity; varying standards and conditions make nationalization schemes of industrial relationship practically impossible.

We cannot pass from this discussion without making comment upon the nearest approach to the Whitley Council plan in the United States. To-day there exists in New York in the men's and boys' ready-made clothing industry a joint council which has the elements of the local Whitley Council plan. The joint council is composed of nine representatives each from the employers' association of manufacturers and from the Amalgamated Clothing Union. These representatives have equal power. The secretary is the impartial chairman of industrial relations, whose office has been created under separate machinery and whose salary is paid equally by both the association and the union. The function of the council is legislative; the execution of the legislative principles lies in the hands of the chairman. The success of this council, affecting some 60,000 workers locally, seems to point the way to the formation at an early date of a National Industrial Council in this trade.

There are several reasons for the success of this council. The industry has been for several years thoroughly unionized. The unions have had complete control of the means of employment. The manufacturers, on the other hand, for the most part are owners them-

selves in the business rather than executives charged with responsibility by shareholders. There is an impartial chairman with well established powers. The trade is centered in four great cities, New York, Chicago, Rochester and Baltimore. Hence, it is easily correlated and standardized. The whole machinery for the establishment of the council was present even before a council was thought of, and all that was needed was the guiding power of leadership. Conditions in the industry are, therefore, perhaps different from those existing in any other industry.

(To be continued)

Slag and the Corrosion of Wrought Iron*

A Demonstration That Slag Is No Preventive —Purity of Metal the Important Factor

BY L. T. RICHARDSON

THE remarkable part of the whole [corrosion] controversy is that neither side gives any direct and definite proof that its contention is true. For instance, the adherents of the pure iron theory do not show that pure iron metal with slag rusts equal to or faster than pure iron itself, nor do the adherents of the physical structure theory show that the metallic iron in wrought iron rusts faster without the slag than with it. This is probably due to the fact that it is impossible to separate the iron from the slag without destroying its identity. Thus it would be impossible to remove the slag from wrought iron without a melting process which would change its nature, since puddled iron has never been in a molten state, and it would be just as impossible to introduce slag into pure iron without some such similar treatment.

The very structure of wrought iron, however, offers a means of testing, to a certain extent, these two theories without disturbing the relation of slag and iron or changing the nature of either. This structure is shown in Figs. 1 and 2—a longitudinal and a transverse section respectively in which the slag inclusions appear as dark lines in the former and as dots in the latter. It is easily seen that in one direction, perpendicular to the slag layers, the metal is not continuous and any oxidation of the metal as it penetrates inwardly from the surface must meet layers of slag. In the other direction, however, that is, in a direction parallel to the layers of slag, the metal is continuous and as it penetrates will not meet the layers of slag or cinder.

Hence, if corrosion is retarded by slag inclusions, as is insisted upon by the adherents of the physical structure theory, one would expect to find that transverse sections of wrought iron will rust more rapidly than longitudinal sections. On the other hand, if the two sections corrode at the same rate, we may conclude that as far as producing any physical obstruction to corrosion is concerned, the slag is inert and that any property of resisting corrosion that wrought iron may possess is not due to slag barriers, but to the purity of the metal or some other cause.

In order to test this line of reasoning, transverse and longitudinal sections about 1/16 in. in thickness were taken from pieces of Swedish iron and wrought iron and subjected to rusting at different times. The pieces were thoroughly annealed and the surfaces made smooth with emery cloth. After weighing and measuring the thickness of each piece in several places, all were placed in a wooden rack, and exposed to the weather as follows:

Wrought iron (A and B)	1 year
Swedish iron	6 months
Wrought iron (C)	2 years

The analysis of the different irons, the exposure data and the results are given in Table 1 and Table 2.

In Table 2 the loss in weight is in grams per sq. cm. and was obtained by cleaning the rusted specimens with a solution of ammonium citrate. The depth of pits was obtained by grinding the surface of the cleaned specimens until the pits on the surface were removed.

It is evident that the amount of total corrosion as given by the loss in weight, as well as the extent of localized corrosion as indicated by the depth of pits, is the same in both transverse and longitudinal sections within the limits encountered in corrosion work.

In order to determine definitely, however, that the slag inclusions offered little resistance to corrosion, it

Figs. 1 and 2.—Longitudinal (Left) and Transverse Structure of Wrought Iron. Slag inclusions are the dark lines in the former and dots in the latter

Table 1.—Analysis of the Various Samples

	Sulphur, Per Cent.	Phosphorus, Per Cent.	Carbon, Per Cent.	Manganese, Per Cent.	Silicon. Per Cent.	Copper, Per Cent.
Steel	0.032	0.079	0.08	0.56	....	none
Wrought iron (A)	0.044	0.132	0.015	0.095	0.193	none
Wrought iron (B)	0.020	0.100	0.020	0.038	0.180	none
Swedish iron	0.015	0.052	0.015	0.011	0.050	none
Wrought iron (C)	0.026	0.115	0.04	0.05	0.210	0.10

Table 2.—Exposure and Loss of Weight of Sections

	Time Exposed	Transverse Section: Loss in Weight	Transverse Section: Depth Pits	Longitudinal Section: Loss in Weight	Longitudinal Section: Depth Pits
Steel	.....	.....	.....	.....	.....
Wrought iron (A)	6 mo.	0.1178	0.035	0.1101	0.033
Wrought iron (B)	6 mo.	0.0791	0.044	0.0789	0.041
Swedish iron	6 mo.	0.1068	0.026	0.1333	0.026
Wrought iron (C)	2 yr.	0.153	0.020	0.154	0.025

*From a paper presented at the thirty-seventh general meeting of the American Electrochemical Society at Boston, April 9, 1920. The author is a chemical engineer, New Brunswick, N. J.

was necessary to show that corrosion actually penetrated layers of slag. To settle this point sections were made of the iron test pieces and examined with a microscope. A representative section is shown by Figs. 1 and 2, which are photographs that include an area 1.5 mm. in diameter. Since in some cases corrosion had penetrated 0.35 to 0.44 mm., it is evident that several layers of slag had been penetrated.

In addition to these data, sections of the specimens have been carefully examined with a microscope and in no case has any visible evidence been found of slag inclusions hindering the progress of corrosion. Likewise, an examination of the corroded surfaces of a number of old irons that have been exposed to corrosion for 10 to 30 yr., failed to show any evidence of slag in wrought iron retarding the progress of corrosion.

In view of the fact that the corrosion of transverse and longitudinal sections is the same as regards loss in weight and depth of pits, the conclusion has been reached that any superior resistance to corrosion that wrought iron may have is not due to slag inclusions, but to some other cause, among which may be mentioned the purity of the iron. Furthermore, it is our experience that the pure irons on the market are very similar to wrought iron in their resistance to corrosion. This would also tend to confirm the above observation.

Mechanical Properties of Forgings and Turbine Steel

The results of a research into the mechanical properties of turbine steel were given by Dr. W. H. Hatfield, Brown-Firth Research Laboratories, and H. M. Duncan, C. A. Parsons & Co., in a paper presented at a recent meeting of the North-East Coast Institution of Engineers and Shipbuilders, Newcastle-Upon-Tyne, England.

The paper constitutes a report of:

1. An investigation into the response which commercial forgings made to the different forms of mechanical testing now in vogue.
2. Similar investigations into the mechanical properties of turbine parts which have given satisfactory service and also of those which have failed.
3. Experiments with the four steels covered in the B. E. A. M. A. specification with a view to determining the mechanical properties, under laboratory conditions, of size, heat treatment, etc.
4. Considerations in the light of the results obtained from items 1, 2 and 3, as to which, if any, additional forms of tests might be adopted for inclusion in the B. E. A. M. A. specification.

The following mechanical tests which are briefly described in the paper were employed during the investigations, and the results obtained are reported: Tensile, torsion, bend, Charpy, Fremont and Izod tests; Arnold alternating test; Stanton, Sankey and Brinell tests; Shore scleroscope hardness tests.

Conclusions from Tests

Conclusions deduced from the investigations were reported as follows:

"1—The commercial forgings investigated have their properties clearly shown from the results of the various mechanical tests performed. A relatively small selection from the tests available is generally sufficient to indicate the quality of the material. The effect of varying amounts of forging on the properties in different directions—longitudinal, tangential and radial—is not yet sufficiently defined. A difficulty in making the tangential and radial tests is that the position of the test-piece (its distance from the axis of the forging) may seriously affect the result.

"The results generally indicate that commercial forgings are of moderately good quality steel, but that the qualities which can be induced in small masses are not obtained nor are they to be expected in large masses.

"2—Turbine parts which have given satisfactory service as compared with those which did not according to our results to date suggest that design may be a factor of greater importance than the quality of the steel. Shaft R.L. 6053, which served successfully for 11 years, as compared with shaft R.L. 6121, which failed after three years, was superior in ductility (elongation in tensile). Since, however, the former shaft was only lightly stressed in use, the figures cannot be considered as leading to any definite conclusion.

"As regards the indications of the various mechanical tests on the forgings and turbine parts investigated, in all cases we can safely say that the tensile test gives a good indication of the quality of the material, though perhaps not sufficient for absolute reliance. The difference between ductility, longitudinally and transversely, is generally shown up in the value for 'elongation' or reduction of area, while the maximum stress reached indicates the condition of hardness or stiffness. While neither of these figures is directly useful in design, they do constitute definite guides as to the condition of the material. The quantities which are of more importance for purposes of design, such as true elastic limit, modulus of elasticity, etc., associated with the given maximum stress and elongation, etc., can be found by independent or research tests for the various conditions of material to be used, but are not necessary for routine tests which have for their object the determining whether material is up to the standard of quality desired.

"The Izod test, which gives an indication of 'notch brittleness,' while being useful for special rare cases where notches enter into design, is of little advantage in large turbine forgings—especially carbon steel forgings, on account of its lack of sensitiveness, the maximum reading on good samples of these being 10 to 15, more common values being five or thereabouts. The Izod test may, however, be usefully retained in some cases of nickel chrome steel forgings as a check on heat-treatment, if the program of treatment is particularly drawn up.

"As regards auxiliary tests, one form of test might be introduced which will confirm, or otherwise, the conclusions drawn from the tensile as to reliability, etc., when tested under different conditions, and probably one such test selected from torsion, Stanton, Arnold and Sankey would be of more direct utility than any of the notched-bar tests, Izod, Charpy or Fremont.

"All these tests indicate clearly if the material is really brittle, and are sufficiently sensitive to bring out differences (for example) between the longitudinal and transverse directions in a forging. The Stanton test probably approaches nearest to conditions likely to be met in practice where design or accident introduces undesirable features, such as sudden changes of cross-section, sharp right-angled corners, and the effect of a blow. The experimental work in this report also enables us to recommend the Sankey test for much more attention from engineers.

"Unfortunately, the number of tests performed is not yet sufficient to enable us to fix definitely what value should be given by the test, and to sufficiently definitely specify the condition."

Strong Demand for By-products

Heavy demand for coke by-products and high prices prevailing are causing the expenditure of millions of dollars for by-product coke installations by iron and steel makers throughout the country. In the Mahoning Valley, for instance, there are 533 by-product coke ovens and some of the products, at present quotations, are more valuable than the steel produced in the contiguous mills. Sales of coal tar distillates are being negotiated chiefly for spot shipment. Demand for benzol is growing, while the market for toluol, solvent naphtha and naphtha products continues strong. Pure benzol is commanding 32½c. in drums and 30c. in tanks at plants of producers.

The Challoner Co. and the Giant Grip Horse Shoe Co. have been combined under the name of the Giant Grip Mfg. Co., Oshkosh, Wis. H. B. Osgood is manager.

Future of American Ferroalloy Industry*

Ore Supplies and Tariff Considerations—Trade Situation—Electric Power and New Plants—Manganese and Vanadium Alloys

BY ROBERT J. ANDERSON

THE future of the domestic ferroalloy industry is somewhat conjectural, particularly as regards ferrochromium and ferrotungsten, as well as ferrosilicon, because of tariff agitation, and the uncertain industrial outlook. There has been witnessed a remarkable development in the United States during the period 1914-1918 in the production of all kinds of ferroalloys, until the world's industry was centered here rather than in France; during 1919, the industry largely collapsed because of definite causes.

Generally speaking, the ferroalloy industry may be said to follow the rise and fall in the steel trade, but it is not advisable to take this generality too literally. The readjustments during 1919 have shown, however, that the domestic industry is not at all likely to decline permanently to pre-war levels, but will continue to hold the greater part of its gain acquired during the war period. The more important factors affecting ferroalloy manufacture in the United States include costs and supplies of metallurgical ores, quality of ores, freight rates on ores and alloys, location of ores in respect to location of hydro-electric power sites, cost of electric power and coke (anthracite coal and charcoal), costs and supplies of refractories and fluxes, demands of the steel makers as to quality of ferroalloys, tariffs and the trade situation, steel output, development and use of special and high-speed steels and several other items.

Supply of Metallurgical Ores

The United States is not internally independent for its supply of metallurgical ores for ferroalloy manufacture, despite the fact that some misleading statements to the contrary have appeared. Moreover, in the case of particular ores such as chromium and tungsten ores, although this country can supply its own internal requirements in emergencies, it is not economically possible to do so in normal times because of the strong competition with cheap foreign ores. It is more precise to say, however, that the strong competition existing among ore miners for the domestic market is rather more among foreign producers than between domestic mines and foreign ones. Unassailable statistics and cost figures have shown that the domestic miner of metallurgical ores of chromium, tungsten and manganese cannot attempt to compete with the cheap and high-grade foreign ores, which can be laid down at Atlantic ports even against high ocean-freight rates at much lower prices than must be paid for lower grade domestic ores f. o. b. mines.

With exception of the period during the recent war, this country has been quite largely dependent upon foreign ores for many years, and it will continue to be so dependent, in the opinion of the domestic ore producers, unless suitable protection is given so that the domestic miners can operate their mines. The Timberlake and Kahn bills, designed to protect the tungsten and chromium interests of the country, may be cited in connection with tariff regulations now pending which vitally concern ore producers, ferroalloy makers and steel manufacturers, and ultimately the consuming public. Constructive legislation is expected to insure the future of the domestic ferroalloy industry in all its branches.

In regard to manganese ores, it is believed that some of the large domestic mines may be able to continue operating, tariff or no tariff, but such mines, as in the past, must be high grade and favorably located with respect to the market. Thus, the Arkansas, Virginia, California and possibly Montana mines will continue to be worked for supplies of manganese ore for ferroalloy manufacture, but the bulk of the manganese ore must continue to come from foreign sources, because domestic ores of the required grade are not existent in sufficient quantity.

The operation of electric-furnace plants near domestic mines will tend to increase, provided hydro-electric power is available nearby and the mine is not too far from the market for ferroalloys. The largest Pacific Coast alloy makers, for example, can doubtless continue to make ferroalloys. Where there is a fairly high-grade manganese mine, near the steel-making center of the United States, as at Neva, Tenn., it will probably be profitable to operate an electric-furnace plant for the production of ferromanganese near the mine and ship the alloy.

The Tungsten Situation

The situation as to available domestic supplies of tungsten ores is one which is so intimately linked with costs and foreign competition that a word of explanation is necessary. Incidentally, it may be said that no branch of the ferroalloy industry is in greater need of stabilization than tungsten. Large supplies of tungsten ores are available in the Atolia, Cal., and Boulder, Col., fields, and the newly opened Nevada district is promising; the surface deposits of exceptional richness in the first two fields are exhausted and deep mining is now required for removing the ore.

However, under an *ad valorem* tariff of 10 per cent on tungsten-bearing ore, American mines must practically suspend operations in a $17 ore market, South American mines must stop production at $11 to $12 a unit, but Chinese ore can still be shipped at $7 a unit (now that Chinese provincial taxes on tungsten ore have been removed). This simply means that the question of price, and price alone, determines where the domestic ferrotungsten maker obtains his ore.

Some qualification of the statement just made is necessary; for example, some grades of Chinese ore containing tin, bismuth and copper are objectionable, and these ores are penalized because of the smelting difficulties. Even under the proposed Timberlake bill, over half of the tungsten-ore supplies for the domestic manufacture of ferro-tungsten and tungsten powder must continue to be drawn from foreign sources.

In the matter of chromium ores, the situation is somewhat analogous to that of tungsten, although even under the prices and demand, restriction of imports, scarcity of ocean bottoms and high ocean-freight rates, more than one-half of the chromite and chromiferous-iron ore consumed in the United States in 1918 came from distant foreign sources, principally New Caledonia, Rhodesia and Brazil. The bulk of the metallurgical ore for the manufacture of ferrochromium must continue to come from foreign sources, tariff or no tariff, but reasonable protection, such as suggested in the Kahn bill, will provide for the average-cost mines operating in competition for the domestic market with New Caledonia and Rhodesia.

There is an abundance of molybdenum ore in the United States, the developments at Climax, Col., being especially noteworthy; all the domestic requirements for metallurgical ore for the production of ferromolybdenum can be readily taken care of by the Colorado mines.

Vanadium ores for the manufacture of ferrovanadium still continue to be drawn largely from Peru, and unless the demand for ferrovanadium increases mark-

*Concluding portion in abstract of a paper presented at the thirty-seventh general meeting of the American Electrochemical Society at Boston, April 9. The author is a metallurgist with the United States Bureau of Mines, Pittsburgh.

edly, there is little prospect that the vanadinites of New Mexico and Arizona can contribute supplies; decline of the Peruvian ore reserves may increase the use of domestic ores. Ferrovanadium is also made, however, from the by-products of radium extraction, and the carnotite ore of Colorado is the chief domestic source of supply of vanadium.

Most of the zirconium ore used to date has come from Brazil, but there is the possibility that the recent Florida developments may be able to supply part of the zirconium requirements of the country.

Electric Power and Ferroalloy Plants

The cost and availability of electric power for electro-metallurgical work is a determining factor in the location of ferroalloy plants as well as in the choice of process employed for some alloys. The domestic ferroalloy industry has been centered for years near sources of relatively cheap power, Niagara Falls and the Pacific coast, largely in the former place, but with the advent of outrageous prices during the war it was profitable to operate plants at points where power was relatively costly and far removed from the steel-making centers.

Ferroalloy plants in the United States will continue to be located chiefly according to the relative weight of these factors: Cost and availability of power; location of hydro-electric plant; distance to steel-making centers; location of high-grade ore supplies. The first three factors are the predominating ones under normal conditions, but emergencies such as a war can radically upset accepted practice. Thus, with prices sufficiently high, it has been profitable to use relatively costly electric power for the manufacture of ferromanganese rather than to employ the blast furnace and coke as a fuel.

The Trade Situation

The trade situation in metallurgical ores and ferroalloys is closely linked with the matter of protective tariffs, but small ad valorem tariffs as embodied in the Payne and Underwood bills had no practical effect on the international markets. The present and recent demoralized exchange rates have proved to be the most disconcerting of tariffs, because with a premium on dollars and a discount on francs, pounds, marks and lire, the foreigner is anxious to sell here and buy elsewhere. Thus, in 1919 it was thought that much of the overstock of ferroalloys held in the United States could be disposed of to satisfy the presumed pent-up foreign demand, but under offerings of foreign alloys at prices below even the domestic re-sale market such hopes quickly faded. There were also abnormally heavy overstocks of ferroalloys on hand in foreign countries when the war ended, and these overstocks both here and abroad caused a temporary flooding of the markets. The result was an extremely confused market in 1919, which was dominated by re-sales, dumping of foreign alloys, and even exports of some domestic alloys (particularly spiegeleisen) against ridiculous exchange values.

Effect of Exchange

Without going into the exchange situation at length, it can be readily seen that foreign business in ferroalloys cannot be booked for large tonnages under present conditions, and the foreign countries must trade among themselves. To consider a specific example; depressed exchange rates are more favorable to England than to the United States because the former country can secure and keep all the European trade she can care for, so long as the British pound costs less in Paris or Berlin than the American dollar. (No consideration is here given to long-term credits or actual barter.)

Unfilled Steel Tonnage a Ferroalloy Barometer

It has been previously pointed out that the domestic consumption is closely linked with the rise and fall in the steel trade, and development in the ferroalloy industry closely follows development in the steel industry. Unfilled steel tonnage is, of course, the barometer of industrial conditions generally, but it is particularly the barometer of the ferroalloy industry, because all metallurgical ferroalloys are steel-making alloys and nothing else. The market in the past five years, with the exception of 1919, was largely a sellers' market, and competition is just beginning to be felt. Ocean freight rates for both ores and alloys may be expected to be reduced, but production costs cannot show a downward trend until the present general inflation is over.

In normal times, Great Britain can dominate the American ferromanganese market, but during the latter part of 1919, with exchange on London at $4.30, British labor costs lower than ours, and their fuel costs higher, domestic and British makers of ferromanganese competed for the American market almost entirely on a delivery basis, because prices were practically the same.

Summary and Conclusions

The future of the ferroalloy industry is bound up with so many conflicting factors and interests that it is unwise to indulge in considerations of too speculative a nature. Certain definite facts stand out very clearly, and we know the following: The electric furnace has made the growth of the industry possible, its prosperity is closely connected with the rise and fall in the steel trade, the further development and use of alloy steels is certain to continue and at the same time increase the normal demand for all kinds of ferroalloys, and it is highly desirable that the United States continues to occupy an important position in the ferroalloy industry of the world, not alone for the sake of supplying domestic steel requirements, largely or in part, or for the sake of additional government revenues, but also for the possibility that emergencies may again arise.

Choosing the Motor Truck*

Almost any blacksmith, in a remarkably short time, could build a truck to direct specifications. From any one of several concerns he could buy a motor of proved worth. From another he could purchase a strong, sturdy frame. He would have a wide selection of reliable, wear-resisting bearings. He could buy well-known axles, gears, wheels, springs, radiator and the hundreds of parts that go into a completed truck. Every unit in that truck would be as good as could be obtained. The truck would possibly be as good as could be built by experts who had to follow instructions to the letter. The blacksmith would only assemble the various units.

But would that truck be a good investment? Would it meet the thousand and one requirements of a good commercial car? It would lack one essential thing. It would lack the experienced designer, who by years of study and test had overcome the stumbling blocks that impede the way of the inexperienced.

Because each part is good it does not necessarily follow that the whole is beyond improvement. Each stone in a mosaic may be perfect, but the mosaic itself will not be good if put together by an inexperienced artist. The only test of truck worth is performance. Performance inevitably reflects the ability of the designer, ability gained only through experience and constant determination to reach perfection. To be a good investment, the truck must stay out of the shop. It must not be held up for roadside repairs. It must give constant service in the hands of the average operator. It must not be wasteful of tires and gasoline. It must have long life. But a truck might be all of these things, and yet, if the first cost is excessive, prove a poor investment.

One would likewise be using poor judgment to buy a truck from a dealer who was not progressive and prosperous. His very prosperity is, in a measure, a guarantee of the worth of the article he sells. Only a prosperous dealer can afford to carry an investment that assures him of a full line of spare parts. Only from such a dealer can you always be sure of efficient service.

*From a monograph by Burt R. Barr, assistant sales manager Stewart Motor Corporation, Buffalo.

BAKING STEEL WIRE IN OVENS

Electric Heaters Versus Coke and Steam—Operating Cost Figures Compared

In the manufacture of steel wire the rods as received from the hot rolls are pickled in acid to remove the scale, dipped in lime water to neutralize the excess acid, and then baked, to drive out the "acid in the steel," the amount of baking depending on how small the wire is to be drawn. If it is to be drawn only one or two holes, a short bake is enough, but for five or six holes the stock must be baked for several hours to withstand the severe drawing. The wire may be, in some cases, additionally heated to dry off grease or oil, or for a low anneal.

At the plant of the Halcomb Steel Co., Syracuse, N. Y., there are two electric drying ovens, using General Electric apparatus. Data and operation figures on this installation are furnished by the General Electric Co., as follows:

One oven is 16 x 6 x 6 ft., with 96-kw. connected, used for drying off the wire at a maximum temperature of 600 deg. Fahr., the other, 40 x 6 x 6 ft., with 234-kw. for drying "acid in the steel," the wire being in the oven from one to ten hours at an average temperature of 350 deg. Fahr. Coke and steam-heated ovens are also used to do the same work, thus it is possible to obtain comparative operation costs.

The following data show the cost of operation of the electric and coke oven for a considerable period of time on the ovens used in drying grease and oil from the steel, with normal production, and also the figures applicable if full production had been possible.

Operation Costs of Electric and Coke Ovens Used in Drying Grease and Oil from Steel Wire

	Production	
Electric—	Normal	Maximum
Cost of power per net ton steel.....	$5.087	$1.19
Annual charges per net ton.....	7.839	.727
Total cost per net ton.....	$12.926	$1.917
Coke—		
Cost coke per net ton.....	$.921	$.171
Annual charges per net ton.....	21.368	1.983
Total cost per net ton.....	$22.289	$2.154

The work of electric power in these tables is figured at $0.95 per kw.-hr.

This shows that as actually operated the coke oven cost $22.289 per net ton against $12.926 per net ton for the electric, a saving of $9.36, while if operated at maximum capacity there would be a saving of $0.237 per ton in favor of the electrically heated oven. The efficiency of the electrically heated oven as actually operated amounts to 3.73 lb. per kw.-hr., or 535 kw.-hr. per ton, the maximum figures being 16 lb. per kw.-hr., or 125 kw. per ton.

The figures on the operation costs of the kiln for drying "acid in the steel" also show a greater economy in the use of the electric oven.

Showing the coke oven as actually operated, costing $2.019 against $1.435 per net ton, for the electric or a saving of $0.584 per net ton in favor of the latter. If they were operated at maximum capacity there would be a cost of $0.046 per net ton higher for the electric than for the coke oven. As operated the efficiency of the electric oven is 24.1 lb. per kw.-hr., or 83 kw.-hr. per ton, while the maximum production figures would be 36.8 lb. per kw.-hr., or 54.4 kw.-hr. per ton.

Operation Costs of Electric and Coke Ovens Used for Drying "Acid in the Steel"

	Production	
Electric—	Normal	Maximum
Cost power per net ton steel.....	$.787	$.515
Annual charges per net ton.....	.648	.187
Total	$1.435	$.702
Coke—		
Cost coke per net ton steel.....	$.253	$.146
Annual charges per net ton.....	1.766	.510
Total	$2.019	$.656

These figures indicate that the electric oven can be operated cheaper than the coke except in one case where it showed a cost of 7 per cent higher. However, these figures take no account of increased perfection, and duplication of results of the finished product due to the perfect temperature control, whereby the operating temperature can be quickly changed when desired. Nor do they take into account the freedom from de-

Electric Oven for Baking Steel Wire

lay due either to the difficulty of obtaining coke at the ovens, or the slower treating of the oven from cold to start of work.

This particular plant is operated on a quality basis, therefore speed is of secondary importance; however, should speed of operation be important the value of the electric oven would still exist, since the uniform distribution of heat gives a rapid rise to maximum heat, and the perfect control of temperature makes it possible to maintain the maximum temperature without danger of overheating. The use of electric heat has not only increased the capacity of the ovens, but produces finished work with no rejections.

In another plant where the wire is not drawn so small, and consequently such a long baking is not necessary, the electric oven installed has an efficiency of 110 lb. per ton on comparatively long bakes at 400 deg. Fahr.

Electric Practice in Making Ferroalloys*

Raw Materials and Operating Practice for Ferrosilicon—Commercial Conditions —Comparison With Ferromanganese

BY W. A. DARRAH

SINCE the furnace equipment, electrical requirements and plant facilities necessary for the manufacture of ferrosilicon resemble to a large extent those required in the manufacture of ferromanganese, it will be unnecessary here to repeat these details. It may be said in a general way that with certain minor modifications present commercial electric furnaces now making ferromanganese can be immediately turned over to the manufacture of ferrosilicon after providing for the usual clean-ups.

At the present time 50 per cent ferrosilicon is manufactured in commercial quantities in electric furnaces in this country. Lower grades are sold at such a discount that their electrical production is not economical, while the higher grades have a tendency to give off objectionable gases which has limited their general use.

Raw Materials

There appears to be a considerable range of material available for the manufacture of ferrosilicon. One large plant operating three 13,500 kva. furnaces uses quartzite (sand-stone containing 98 per cent silica), low grade iron ore and quartzite with so little alumina content that no slag troubles are normally encountered. Another plant operating 2000-kva. furnace uses quartzite and iron scrap and employs anthracite coal for the reducing material. Both of these plants reported that they had had excessive trouble with clean silica sand, while a third plant operating a 1300-kva. furnace claimed to secure excellent results, using clean silica sand, coke and scrap iron. The consensus of opinion appears to strongly favor quartzite, both because of the purity and the mechanical form, claiming that sand is so fine that it usually clogs the furnaces.

Operating Practice

The general methods of charging and tapping a ferrosilicon furnace are identical with good practice in the ferromanganese furnace. The working temperatures are somewhat higher, as 1800 deg. is sometimes obtained in the fused bath. It is impracticable to stir the ferrosilicon bath or furnace charge with an iron bar of any kind, since it will be immediately melted off. Similarly great care must be taken to keep the ferrosilicon while hot away from all iron parts of the furnace, as it will very quickly eat through. Water must be kept from coming into contact with the interior of a ferrosilicon furnace as the charge is explosive in the presence of water.

It is the usual practice to line the bottom of the ferrosilicon furnaces with carbon. Contrary to what might be expected, the amount of carbon absorbed by the fused baths is negligible and furnaces thus lined have stood 18 months' continuous operation without trouble.

Hand control of the electrode motors is usually employed, since as in the manufacture of ferromanganese changes of voltage and current are gradual. Automatic regulation appears to be an unnecessary expense, unless the labor situation is very serious. One very large producer anticipating a serious labor situation in the future, is equipping this plant with automatic regulators for this reason alone.

Commercial Conditions

While ferrosilicon now sells for materially less than ferromanganese it should be kept in mind that raw materials necessary to its production are likewise much cheaper and more easily obtainable than manganese ores. For these reasons ferrosilicon is being made in a number of relatively small poorly equipped plants and therefore there is likely to be more competition in the future on this product. Ferrosilicon also requires less highly skilled supervision in its manufacture and is not subject to the losses resulting from careless operation, that sometimes occur in the production of ferromanganese. Ferrosilicon, 50 per cent grade, can to-day only be commercially manufactured in the electric furnace, so that blast-furnace competition will not affect the price situation. This would indicate that when conditions become normal the manufacture of ferrosilicon will be a competitive business, in which the manufacturer having the most efficient plant, cheapest supply of raw materials and best freight rate will succeed. The cost of power is a somewhat larger percentage of the total cost than in the case of ferromanganese, but is not likely to be a large enough proportion of the total cost, to be a serious item from the standpoint of competition within the United States. Foreign competition will become an exceedingly serious matter, however. In general the feeling among Eastern manufacturers and users is that ferrosilicon will be a more profitable business than the manufacture of ferromanganese, when conditions become normal.

*Second and concluding installment, the first appearing in THE IRON AGE, April 8, and discussing electric ferromanganese. The author is vice-president Continental Industrial Engineers, Chicago.

The Strauss Bascule Bridge Co., Chicago, has been appointed engineer to design the bascule span of a joint railway and highway bridge over Inner Harbor at Johnson Street by the City of Victoria, B. C. The cost of the bridge will be borne jointly by the City of Victoria, the Provincial Government of British Columbia and the Canadian Pacific Railroad Co. Preparation of plans and specifications will begin just as soon as all details regarding the requirements, as to length of span, etc., are determined.

American cutlery sales in Brazil in 1917 amounted to $87,000 out of a total import of $140,000. One year later the American cutlery imports amounted to $208,000 out of $297,000. Japanese cutlery meanwhile begins to enter the world's markets in increasing quantities. Of late much Japanese cutlery has entered the American Philippine Islands, where it makes serious competition with cutlery made by American labor and imported from the United States.

The Söderberg Self-Baking Electrode*

A Norwegian Invention Insuring Continuous Electrode Supply—How It Is Made, Electrode Consumption and Advantages

BY JOSEPH W. RICHARDS

THE Söderberg self-baking electrode may be in general described as embodying the idea of feeding continuously unbaked electrode mixture to the furnace, the mass being baked by the heat of the furnace in which it is being used, and the apparatus being so arranged and worked that the operation is practically continuous during the life of the furnace. The idea therefore entirely dispenses with the use of previously-baked electrodes and with their replacement or introduction from time to time in the furnace. In

A Close-Up View of the Söderberg Electrode

operation, the baked end of the Söderberg electrode is always in the furnace, while the unbaked part is outside and can be lengthened from time to time as the electrode is consumed.

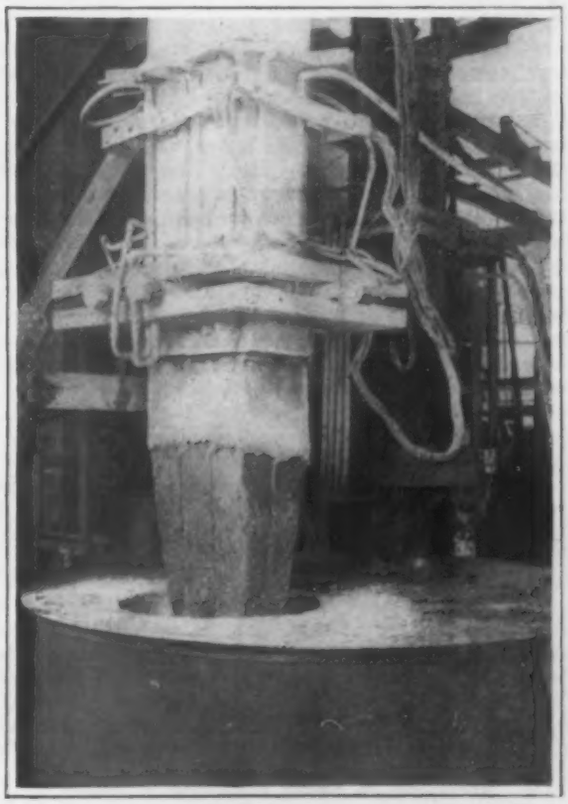
The heat necessary to bake the mass is all conducted from the lower, baked end, or contributed by hot gases or radiation, or partly derived from the passage of current through the baked part.

The electric current is best introduced at the lower or baked end of the electrode, where the hot carbon has become conducting, but may, in small electrodes, be introduced higher up if an iron casing is provided to carry the current from the unbaked part to the baked part of the lower end. In usual practice the movable electrode holder is placed near the top or roof of the furnace, and encircles the iron casing in which the electrode mixture is encased. The baking takes place comparatively close to the furnace, usually at a small distance above the electrode holder, when the latter is in its usual position encircling the electrode close to the furnace.

If the design of the furnace requires it, the electrical connection may be made higher up, or further from the furnace, especially with smaller electrodes, but in this case the iron shell must be heavy enough to carry the current past the unbaked mass to the baked and conducting part of the carbon electrode.

The casing is thus an important part of the electrode system. It may be made as a thin casing merely surrounding the electrode or as an exterior shell provided with interior protecting ribs, which latter strengthen the structure and add to the longitudinal conductivity of the electrode as a whole. The casing has, further, the function of holding the electrode shape and size while new mixture is being added; also of protecting the carbon from exposure to the air and consequent combustion before it enters the furnace. It also facilitates the transfer of electric current, with small loss, from the holder to the electrode. It also stiffens and reinforces mechanically the unbaked part of the electrode. It should be strong enough to keep its shape during the stamping in of fresh electrode mixture.

The writer spent some time, in August, 1919, inspecting the operation of a Söderberg electrode at



A Rectangular Self-Baking Electrode Recently Made in Norway. It is in use on a furnace calcining coal for electrodes and is here shown pulled out of the furnace temporarily

Fiskaa, near Christiansand, Norway, where the following observations were made. The whole operation of construction and working of a Söderberg electrode may be considered under the following headings:

Preparation of the electrode mixture.
Design and construction of the iron casing.

*From a paper presented at the Thirty-seventh General Meeting of the American Electrochemical Society of Boston, April 10. The author is professor of metallurgy, Lehigh University, Bethlehem, Pa.

Lengthening the electrode by adding new sections of casing.

Stamping fresh electrode mixture into new sections.

Preparation of Electrode Mixture

The raw electrode mixture is practically the same as is used in ordinary carbon electrodes which are to be baked. The ingredients consist of coke, anthracite, tar and pitch, all finely ground and mixed together in the usual proportions at a temperature of about 80 deg. C. (176 deg. Fahr.). In order to obtain a higher conductivity in the baked carbon, the anthracite used is preferably semi-graphitized. This is done by heating it in an electric furnace of the usual type for this purpose. The mixing with pitch and tar is done in the usual manner in a heated mixing machine. If the mixture is allowed to cool, it must be re-heated to about 80 deg. C. (176 deg. Fahr.) before it can be stamped into the electrode.

Construction of the Iron Casing

The iron casing is made in sections of suitable length, which varies with the size of the electrode and the conditions of its use. Each section is made alike, and new ones are riveted or welded to the old ones to elongate or extend the electrode.

The individual sections are constructed of several longitudinal segments which are bent at a right angle so that one part forms part of the wall of the section while the other part projects inwardly towards the center of the circular section, forming a rib or partition which will extend into the electrode mixture. These partitions are pierced with holes or "ports" to keep the mixture united through the ribs and thus prevent its separation or cleavage from the sheet-iron partitions. The outer shell is pierced with numerous holes, which are punched, chiseled or drilled, to allow free escape for tar vapors.

With the contact holder clamped close to the furnace, thin sheet iron is used for the casing, 0.5 to 0.9 mm. thick (20 to 26 g.) With smaller electrodes and the air-cooled holders clamped to the upper part of the electrodes, sheet of 0.9 to 1.5 mm. thickness is used (16 to 20 g.). In the latter case, the iron has sufficient cross-section to carry the whole current. The 850 mm. (34-in.) electrode seen in operation at Fiskaa was carrying 23,500 amperes, at an average current density of 4.2 amperes per sq. cm. The cross-section of the carbon in this electrode is 5670 sq. cm. and that of the iron 77 sq. cm. The iron alone should be able when cold to conduct all of this current without serious heating, making the electrical conductance of the cold electrode virtually independent of the carrying power of the carbon mass, whether it is baked or unbaked where current is passing.

Lengthening the Electrode

When in use, the upper or outer end of the electrode is lengthened from time to time in proportion as the lower end is consumed. This is done by adding a section of sheet-iron casing and stamping it full of raw electrode mixture. The operation of lengthening the electrode consists of placing a new section of iron casing on top of the electrode and either bolting, riveting or welding it into position, the latter either electrically or with the oxy-actelylene blowpipe flame. The practice is well organized and effective, but it is probable that still further improvements may be made in these details as the method is further developed.

Stamping In Fresh Electrode Mixtures

The stamping in of the electrode mixture, properly warmed to make it soft, is done either by hand ramming or by compressed air hammers. An automatic machine can be used for this work when the inner construction of the iron casing is not too complicated. In starting an entirely new electrode, it is built up of several sections in the manner indicated and the lowermost section is then baked by a moderate wood fire, piled around it. This solidifies the lower section so that the entire electrode can be lifted and put in place in the furnace, the holder adjusted and the current turned on. The electrode rests at first on some coke piled on the bottom of the furnace, and a small current is put on at first, rising gradually to full load.

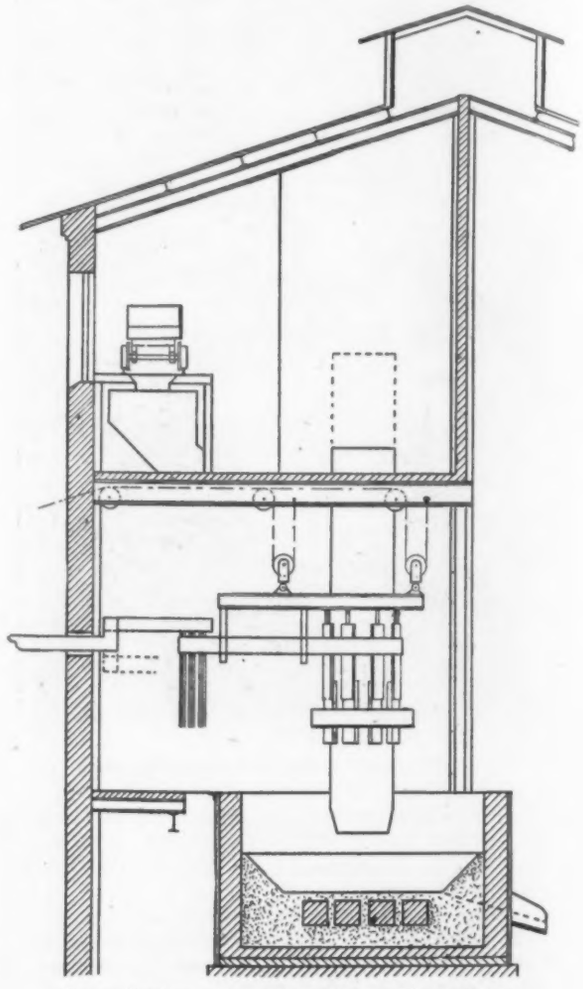
The holder may be of any usual or effective design. That used on the 850 mm. electrodes at Fiskaa is octagonal, having eight water-cooled contact pieces, each 80 cm. (32 in.) long (high) and made of brass. Clamps enable it to be screwed tightly in place; it can be moved when necessary, which may be only once or twice a week, with only a few minutes interruption of the current.

Advantages of the Söderberg Electrode

Baked carbon taken from the furnace end of a Söderberg electrode is dense, hard, and of the ordinary quality of previously baked electrodes. It shows in this respect no difference from ordinary carbon electrodes. Laboratory tests at Fiskaa on such specimens have shown:

Specific gravity about 1.5.
Electrical resistivity (cold) 0.007 ohm per cm. cube.
Crushing strength about 150 kg. per sq. cm. (2140 lb. per sq. in.).

The Söderberg electrodes will certainly increase



Cross Section of a Ferrosilicon Plant Using the Continuous Electrode

the regularity of running of electric furnaces to which they can be adapted, both because of their absolute continuity in respect to absence of joints and because of the uniformity of quality of the raw materials going into the electrodes.

The Söderberg electrodes, further, obviate the shutdowns which are necessary when built-up previously-baked electrodes are being changed or renewed, and this continuity of running is undoubtedly of great technical and still greater economic advantage.

Where the Söderberg electrodes can be used, they are certainly much cheaper to use than ordinary previously-baked electrodes.

In the period July 22-Aug. 11, the electrode consumption at Fiskaa was taken during a regular run.

No breakages took place in this period and in consequence no disturbances of the running occurred from this cause. The average electrode consumption, while producing 50 per cent ferrosilicon, was about 53 kg. per ton of 50 per cent ferrosilicon. The furnace construction, however, caused a considerable phase displacement of the current (Cos. φ about 0.63) and considerable electric energy was also lost in the iron work around the furnace. For these reasons this electrode consumption is considerably greater than it would have been if the electrical conditions were more favorable.

The table gives the interruption of the current caused by stoppages for lifting the electrode holder. In the whole period there was used for this purpose 51.5 min., divided between six separate liftings of the holder and contacts. I saw the contact ring lifted at one operation about 30 cm., consuming four minutes, during which time the current was taken off the furnace. Usually it can be assumed that interruption of the current for this purpose is necessary every third to fourth day, and only for about five minutes each time.

Voltage and Energy Losses

The specific resistance of the hot, baked electrode (carbon and iron) based on a drop of voltage of 0.5 volt between points 30 cm. (12 in.) apart, is equal to 0.00402 ohm per cm. cube. The electrical and thermal conditions vary somewhat with the position of the electrode holder. This is particularly true of the contact resistance between the contact pieces and the iron casing of the electrode.

Uses of the Electrode

The electrode in use at Fiskaa had been in continuous work since July 22, 1919, a little over three weeks. The electrode was used in a single-phase furnace of common type, with bottom electrode, and was employed in making 50 per cent ferrosilicon.

The power-house conditions did not permit a greater voltage on the low-tension side of the transformer than about 50 volts, on account of the high amperage which was necessary in order to thoroughly test the electrode. Because of these electrical conditions the electrode had to work quite deep in the charge, and consequently a greater consumption of electrode was recorded than would have been necessary under more favorable electrical conditions. The consumption of carbon electrode during the above period (not including the iron of the casing) was 53 kg. per ton of ferrosilicon alloy produced.

The electrode worked in all respects fully satisfactorily and no annoyance or trouble was experienced from tar vapors, which are expelled very slowly by reason of the very slow baking of the electrode. The baking takes place continuously and slowly at about the region or zone of the upper part of the contact with the holder, not on a horizontal plane across the electrode but at a higher point in the middle of the electrode than near to the outside surface. The contacts of the holder are moved up a suitable distance every third or fourth day during normal working; after each such movement upwards of the contacts tar gases appear below the holder contacts and burn gently for some three or four hours.

A 10-In. Söderberg Electrode in Use on a Small Ferromolybdenum Furnace in Norway. It is temporarily withdrawn from the furnace

Table of Data on Ferrosilicon Furnace, Using Söderberg Electrode.

Furnace type: Built for 1,500 kw. with Scott connection used as a single-phase furnace with embedded bottom and top electrodes, taking on the average about 750 kw. with about 50 volts at the transformer terminals.

Dimensions of electrode: Diameter 85 cm. (34 in.). Cross section of carbon 5,670 sq. cm. Cross section of iron 77.1 sq. cm. *July-August,* 1919.

Operating periods	Operating time, hr.	Average of current in amperes	Current per sq. cm, of carbon section	Electrode Consumption per hr., kg.	Electrode Consumption per 10,000 amp. hr.	Electrode Consumption per ton 50% FeSi kg.	Electrode Consumption per 1,000 kw. hr., kg.	Kw.hr. per ton 50% FeSi	Remarks
From July 20 to 28....	175	.....	.....	2.57	....	50.7	4.1	12,500	Altogether 30 minutes interruption of current while lifting electrode holder twice. No shifting of the holder.
From July 29 to 30.....	48	20,000	3.54	2.71	1,355	31.5	3.3	8,470	6½ minutes stop for lifting holder.
From July 31 to Aug. 3.	93	18,700	3.30	4.56	2,420	49.5	5.7	8,710	Altogether 15 minutes stoppage for lifting holder 3 times.
From Aug. 4 to Aug. 11.	191	23,100	4.07	4.21	1,820	66.5	6.0	10,900	
From July 20 to Aug. 11	507	.....	.....	3.55	....	53.2	5.1	10,500	

The use of the Söderberg continuous electrode will undoubtedly show advantages in open or partly closed furnaces such as are at present used for the production of various ferroalloys, calcium carbide and similar products. Especially will this be the case where it replaces built-up electrodes with contacts for conductors placed on the upper end.

Electrodes of still greater size than the 850 mm. (34-in.) electrode in use at Fiskaa can undoubtedly be made and operated, which will be of particular advantage when replacing the largest sizes of built-up electrodes, with consequent saving in electrode material, labor, time and expense.

In closed furnaces with vertical electrodes, and where these are not exposed to any considerable lateral pressure from the charge, the use of the Söderberg continuous electrode may be also of advantage. In this class of furnaces can be included most of the electric steel furnaces at present in use.

In furnaces where the electrodes pass through an arch into a closed melting chamber in a position more or less inclined to the vertical, and are exposed to lateral pressure from the charge, the use of such self-baking continuous electrodes may be possible, but will require the making of practical tests to adjust them to meet these requirements.

[A discussion on this paper appears in THE IRON AGE, April 15, and on account of its introduction into the United States.]

Judge Gary Reviews Prevailing Conditions

Discusses the Decision of the Supreme Court in the Dissolution Case—Disapproves Shop Committees Except as Provided for by the Corporation

AT the annual meeting of the United States Steel Corporation Monday, April 19, Judge Gary, chairman of the board, discussed labor and business conditions at length.

Daniel G. Reid, whose term as a director of the Corporation expired this year, was not renominated and no one was nominated to succeed him. The directors will fill the vacancy later. Mr. Reid has not been active in the affairs of the Corporation for the last year, but he had been a member of the board ever since the corporation was formed in 1901. Retiring directors were re-elected with the one exception. The recent election of Richard V. Lindabury to succeed the late H. C. Frick and William J. Filbert to succeed the late Robert Bacon was approved.

Judge Gary's Address

Judge Gary spoke as follows:

"Since the United States Steel Corporation commenced business on April 1, 1901, there have been held, including the present one, 19 regular and also 10 special stockholders meetings. I have had the honor of presiding at every one, and of voting the major part of all the outstanding capital stock. For the confidence reposed and the uniformly courteous treatment accorded, I am appreciative and grateful.

"The suit brought in 1911 against the Corporation by the Attorney General under the Sherman law, so called, has recently been decided by the Supreme Court of the United States in our favor. So far as I am informed by newspaper editorials, by other publications, by large numbers of letters and telegrams and by verbal communications, approval of the decision was practically universal.

"Observation was made by a number of commentators that, as the Supreme Court decided the case by the vote of four justices (including the chief justice) to three justices, the victory was less emphatic. In this connection, however, it may be remarked that at the hearing of the case by the Circuit Court of Appeals at Philadelphia in 1915, the four presiding judges unanimously decided in favor of the Corporation. All of these judges are recognized to be fully competent to serve as members of the Supreme Court of the United States. Therefore, the final result represents the opinions of eight judges as against the opinions of three. And it is generally considered by judges and lawyers that majority decisions of the courts of last resort rank highest because they are made after full and thorough examination, discussion and consideration.

The Sherman Law

"The Sherman law, under which the case was brought, contains two sections which read as follows:

> Sec. 1. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal.
>
> Sec. 2. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a misdemeanor.

"It was intended to prevent either monopolies or undue restraint of trade. All the claims made by counsel for the Government in the pleadings and discussions in our case related and were confined to these two subjects. All evidence introduced was intended to establish or disprove the existence, practice or intention of a monopoly or restraint of trade.

"The Chief Justice and three other justices of the Supreme Court and the four judges of the Circuit Court of Appeals held in favor of the Corporation, both as to monopoly and restraint of trade; and the decision was on the merits—on the facts as shown by the evidence. The case was defended by the Corporation on the facts. It raised no new question of law. It relied upon the law as clearly and convincingly pronounced by the Supreme Court in previous decisions, and in the pleadings, the introduction of evidence and the arguments of counsel, it was contended the law had not been antagonized.

"Multitudes of witnesses, including customers, competitors, employees and representatives of the general public coming from all parts of the country, testified in favor of the Corporation. No doubt the patient and exhaustive investigation of the evidence and the clear and able presentation of the facts in the opinions delivered by the judges of the Circuit Court of Appeals had much to do with the final determination by the Supreme Court. The Government did not and could not obtain the testimony to controvert the defense established.

The Rule of Reason

"It is fortunate for the country, for the maintenance and stability of industrial progress and prosperity, that the Supreme Court some years ago, and now in the case against the Corporation, declared the rule of reason must govern the interpretation and the application of the Sherman law to the facts in any case presented, sometimes deciding in favor of the Government and sometimes against, but always in favor of the principles, the intentions and the objects of the law.

"It is an inexcusable mistake to suppose that the Supreme Court has intended to limit or qualify the Sherman law. As I see it, the court has simply with great force, logic and justice, stated the old principle that laws must, in accordance with their spirit and intention, be reasonably construed and applied to the facts appearing. And in determining what is reasonable it would seem eminently proper that as a law is enacted for the protection and benefit of the general public, the effect of construction and application upon the welfare of the public should not be ignored. So far as the Corporation and its subsidiaries are concerned, we shall not disregard the laws of the country or the public interest.

"The Supreme Court, in the opinion rendered, intimated that the Corporation, or some of its subsidiaries, during the earlier years had indulged in questionable practices, stating, however, that as they had been voluntarily abandoned long before the Government suit was commenced, they could not be considered in determining the case before the court. The evidence relating to these matters had no bearing unless it tended to show the disposition of those who were connected with them to monopolize or restrain trade and commerce. As these questions were alluded to, it seems to me proper to briefly discuss them at this meeting, for you are interested in and entitled to know the exact truth concerning the attitude and conduct of those you have selected to manage your property and business.

Pooling Agreements

"It was contended by counsel for the Government that, for a time, certain subsidiary companies joined other outside manufacturers in carrying on arrangements for pooling business and profits and thereby securing higher prices and larger returns. When the

Corporation was organized in 1901, it had been the common practice of many, if not most, lines of business to maintain periodically or intermittently similar pools, and this habit was inherited, so to speak, by the Corporation. In these days something of the kind seemed necessary to minimize the effect of unreasonable and destructive competition and it was believed they were not improper. Indeed, Senator Hoar of Massachusetts, who was the chief factor in preparing and advocating the passage of the Sherman law, had given a written opinion that these pools were lawful and proper. Even though he was wrong, his opinion was relied upon by industry generally. But in about 1904 the Supreme Court, in a case from Ohio, decided that the pooling system was improper. Thereupon our Corporation, through its chairman, employed a lawyer of high standing and acknowledged ability, not connected with our companies but totally independent, to make a thorough examination of the affairs of all our companies, with the direction that, if he found any impropriety in management, to see that it was immediately discontinued and abandoned; and these instructions were promptly carried into practical effect.

Gary Dinners

"Again, in the opinion, reference was made to the 'Gary dinners,' so called, or the movement for stabilization of business, connected with or growing out of these dinners. The dinners themselves were four, five or six in number.

"You will remember the panic of 1907 and the demoralized conditions which prevailed for a short time in industrial and financial circles. Many banks were closed, loans were called, that is, payment demanded, large accumulated stocks of products, including iron and steel, were in danger of being sacrificed, and in short irretrievable disaster was seriously threatened. As steel was considered the barometer of trade, I with others was approached by the leading bankers, including J. Pierpont Morgan, that great constructive force among the financial giants of the world, to do what we could to stay the threatening storm which would spell ruin to multitudes of people if permitted to go unchecked. In response to these urgent and insistent appeals, the chairman of this Corporation invited the leaders in the manufacture of iron and steel, together with many of their customers, to a dinner and then proposed a plan for stabilization of industry. The Corporation also, after consulting the President of the United States and the Department of Justice, purchased the Tennessee company, whose securities were largely on deposit at the banks as collateral. You know the results. If we may rely upon the statements of leading bankers, representatives of other lines of industry and multitudes of others, expressed in various ways, the action of the iron and steel interests had an immediate and decided influence for good on the general situation.

"Immediately following the first dinner, report was made to the President and the Attorney General and to the public press, of the proceedings and purposes of the meetings and the same applies to the subsequent dinners and consultations.

"The propriety of this movement was for the first time publicly questioned by members of the Stanley Congressional investigating committee; whereupon it was at once discontinued and abandoned.

"What was done by the iron and steel representatives, supposedly for the public interest, was like the action taken by the Government itself during the war, except in the latter case the consultations and co-operation of the iron and steel men, under the direction of the representatives of the Government, were more pronounced. In both cases, even if the movements were technically inimical to the purposes of the Sherman law, the necessities of the occasions for the prevention of public calamity fully justified them.

The Steel Strike.

"During the year 1919, there was considerable interruption to business progress by the strike of Sept. 22. You know by reports in the public press and otherwise substantially what occurred; of the lack of reason for its precipitation and of its failure. It was instituted, not by employees themselves, but by union labor leaders pursuant to a resolution introduced by W. Z. Foster (in no way connected with the industry) at St. Paul, Minn., on June 13, 1918, for the specified object of organizing the iron and steel industry. The resolution reads as follows:

> Whereas, The organization of the vast armies of wage-earners employed in the steel industries is vitally necessary to the further spread of industrial democracy in America; and
>
> Whereas, Organized labor can accomplish this great task only by putting forth a tremendous effort; therefore be it
>
> Resolved, That the executive officers of the American Federation of Labor stand instructed to call a conference, during this convention, of delegates of all international unions whose interests are involved in the steel industries, and of all the State federations and city central bodies in the steel districts, for the purpose of uniting all these organizations into one mighty drive to organize the steel plants of America.

"In September, 1919, a small percentage of the employees were members of labor unions. When they were called out they responded and, as the result of threats and intimidation, others temporarily quit work so that altogether about 26% of the men were out for a short time. The majority of the men were steadfast and loyal, and, as you see by the annual report, the total results for the year were good.

Criticism by Outsiders

"As a rule, criticisms of employment conditions, if any, are made by outsiders—by union labor leaders, or by others who are usually uninformed and who voluntarily seek to represent labor on the alleged ground of service to those who are not competent to protect their own interests. These outsiders assume they are more interested in employees than their employers and that they, the outsiders, are qualified to lead the employees into paths of comparative ease, contentment and profit; both are violent presumptions.

"We never resent unfavorable criticism from any source concerning our attitude toward employees, if made in good faith, even though it may not be deserved. Whenever proper and practicable, we adopt measures to improve the living and working conditions of our workmen; and we pay on the average the highest rates paid for similar services in any basic industry in the world. For verification of these statements, read our published reports and other publications.

"We have a splendid, efficient organization, from the lowest to the highest paid employee and we are appreciative and we seek to demonstrate this in practice. We know that for real success the management is dependent upon the workmen, as the workmen are likewise dependent upon the investment in the business and the talent employed to utilize to the best advantage the opportunities offered. We believe in co-operation between employer and employee; in affording every employee the chance to advance, according to merit, from one place to another, without interference or restriction by outsiders, and to become pecuniarily interested in the property and business by securing, on liberal terms, a stock interest. You will notice by the annual report scores of thousands of our workmen are stockholders. During the emergencies of the war, our employees remained at their posts of duty continuously, so that the steel for the military necessities of our Government and its associates in the war, was continuously supplied. This was not because of the counsels of union labor leaders, as sometimes supposed, but in spite of them, as I could, if time permitted, demonstrate by recitation of the facts.

Position as to Labor Unions

"We do not combat labor unions as such. We, of course, acknowledge the natural right of labor to organize; but we insist that a labor organization

should be subjected to governmental control and regulation like other organizations. Discrimination by law in favor of or against any particular class is detrimental to the interests of the general community. It contradicts the fundamental principles of our Government.

"We stand for the open shop, which permits a man to work when and where he pleases, on terms mutually agreed upon, whether he does or does not belong to a labor union. Our men generally do not belong to labor unions because they know by long experience it is to their advantage to be free from dictation by outsiders; that they are receiving as large, or larger, compensation and as good, or better, conditions for themselves and their families as would be provided under labor union domination.

"We intend to maintain and shall aim to improve these conditions. We believe, and we think the general public is of the same opinion, that the welfare of mankind will not be promoted by 'the one big union,' by the organization of the entire industry of the country, or by the control of industry under the arbitrary direction of an organized minority. A studious, thoughtful, fair-minded, intelligent general public is at present considering these vital questions, for they are paramount in the determination of the great economic and social questions of the day.

Shop Committees

"Much consideration of late has been given to the subject of shop committees, whereby groups of men may present to the management for discussion and decision any question relating to employment conditions. We have made diligent investigation of these matters. Up to date we think no plan better, or more satisfactory to employees than our own, has been tried. We have learned of many demonstrated failures of others.

"Any employee or any self-appointed group of employees from any department throughout our large and diversified works and activities is at liberty at all times to present to the respective foremen, and, if desired, to the higher appointees or the officials, all questions involving the interests and welfare of both employee and employer for discussion and disposition. In this way fair and satisfactory adjustments are made.

"We find by experience this method insures a friendly sentiment, a fair and reasonable solution and an increased effort on the part of employee and employer to aid each other in honestly and appropriately protecting and promoting the interests of both. And yet we shall always study, digest and develop every question presented which involves the living and working conditions of our employees, remembering there are two sides and that it must be answered in accordance with the principles of justice to all concerned.

Hours of Work

"Another problem which has caused anxious inquiry on our part relates to the hours of work per day. It is a difficult one on account of the nature of operations at some of our plants. Those who sometimes suggest there might be fewer hours do not show us a practical method, taking into consideration existing circumstances. They do not offer a feasible plan for maintaining continuous operations under a short day service, especially in view of the fact that the men themselves will not submit to it unless they are paid compensation for short days equal to the full amount which has been paid for longer days. So far as the workmen are concerned, they are not satisfied with short days, if larger pay per day can be secured by working longer days. The whole question resolves itself into increased and increasing rates of compensation. It has occasionally been urged that we should establish the universal rule of short days and compel our men to observe the same against their objections. Needless to say, these suggestions, like many others relating to labor, are offered by those who have never had any experience in the employment of considerable numbers. Their lack of competence to give advice is in proportion to their want of experience. This is not unusual in any field of action.

"However, we have been and are giving a good deal of thought to this subject and have made changes when found practicable.

Price Policy

"Inquiry has been made by some of our stockholders as to why, in view of the great demand, the cost of production and the prices received by other manufacturers, we hold the selling prices of our commodities down to those which were fixed by agreement between the Industrial Board and steel manufacturers at Washington, March 21, 1919.

"It seems to us the problem of high cost of living is of convincing importance. When the increasing tendency is to insist upon payment of unreasonable sums for every commodity and for every service, so that the vicious whirl of advancement seems to be unending, we think there is a moral obligation on the part of every one to use all reasonable efforts to check this carnival of greed and imposition, even at some sacrifice. There is a growing discrepancy between different individuals and interests. The man with a fixed income is more and more disadvantaged and he is helpless. He cannot increase his income to meet the increased cost of living. Therefore, it should be the effort of all to establish and maintain a reasonable basis of prices; certainly to prevent further increases; otherwise the Government, from the standpoint of protection of a part of the public, must interfere.

"A few days after the armistice was signed in November, the chairman of this corporation called a meeting of representatives of the iron and steel trade and then presented and argued in favor of the idea of voluntarily reducing prices, and at the end of a day's discussion it was decided to recommend a reduction of about $5 or $6 per ton to take effect Jan. 1. In March following, the Industrial Board, appointed by Secretary Redfield, as I understood with the approval of the President, requested the chairman of the corporation to again call together representatives of the iron and steel industry to appoint a committee to come to Washington and there discuss the propriety of further reducing and of stabilizing prices. The committee was appointed, met the Industrial Board, and after two or three days' discussion, prices were again reduced $5 or $6 per ton and the announcement was published in the newspapers. These prices have been steadfastly adhered to since that time by the corporation; and I think this position has had considerable influence in preventing increases in the general selling prices of steel although some have made them, due, as they claim, to increased cost of manufacture.

"Moreover, it is believed that, in view of all the conditions prevailing, the selling prices of most of the diversified products of the corporation, for the present at least, are high enough, though it is pertinent to say that when the actual value of the properties and volume of business of the corporation are considered, the net return is at least moderate.

Dividend Policy

"The chairman is occasionally in receipt of letters from stockholders asking for the payment of larger dividends on the common stock; and sometimes, I am sorry to state, claiming that we appropriate too much money for the wages or welfare of employees.

"Your chairman and other officers and directors are substantial holders of the preferred and common stock of the corporation. They are interested in the subject of dividends the same as all other stockholders. They have no inside, advance information in regard to quarterly returns. They do not speculate. It is the principle and policy of the corporation to manage its affairs with the desire to add to the intrinsic value of the stock regardless of the figures quoted on the Stock Exchange. This will sooner or later inevitably result in larger selling prices. We are in many ways strengthening and fortifying the corporation for suc-

fairs of the corporation are intended to be thoughtful, painstaking and conscientious.

"It has been the ambition of the directors, finance committee and managers of the corporation, from the beginning of its existence, to prove in practice that a corporation is not necessarily without soul as sometimes charged, but that figuratively speaking it may be possessed of mind, heart and soul.

"I could say much in favor of the management in detail of our affairs and in respect to the values of our properties and business; but as to the former I prefer to let others speak and concerning the latter the figures which are published from time to time speak for themselves."

Holding Cash in the Treasury

At the conclusion of his prefaced address, Judge Gary spoke extemporaneously as follows:

"This question of dividends, which has been very properly referred to by one of the stockholders, is important and always in the minds of the directors and members of the finance committee and officers of the Corporation, sometimes occasioning doubt as to exactly what to do at a particular time; but it is always resolved in favor of what we conceive to be conservative, safe results.

"As I have stated before at stockholders' meetings, the amount of earnings carried to surplus does not determine the sum which can properly be spared for dividends, because it is not in cash; a large part of it, the major part is, and must be invested in properties, otherwise we could not hold our position in business. It is true we have a large amount of cash on hand always but as our business has expanded, a good deal more than doubled from the beginning, as the result of more than doubling our capacity and perhaps more than doubling our efficiency per ton, it has required a very large amount of cash on hand to keep our business properly going, and to be able to secure at all times, or to provide such properties or such extensions and improvements as may be offered and which are requisite for maintaining our position in the business—the position to which we think we are entitled.

An Illustration

"Just to give you a single illustration. We had recently the opportunity to buy a property or to contract for it—we have not secured it yet—that we very much needed in the effort to perfect our properties and our business, and at a price which was perfectly reasonable and fair, an opportunity which we should not lose, which stockholders might readily and properly blame us for not securing. That has happened a good many times. We seize upon those opportunities. We are making diversifications in our business; they furnish the backbone of our great strength. Of course, it requires a great deal of money to make them and to experiment. And it is a pity that stockholders have to wait for the time being for the final benefit resulting from these expenditures. Nevertheless they are made wisely. If that money should be distributed in dividends, it would be done more or less to the prejudice of the Corporation and the permanent stockholders, and perhaps somewhat to those who receive the dividends, for they would have to pay out a large proportion of them in income taxes, although we have not withheld any dividends on that account. I am speaking of results.

Panic of 1907 Recalled

"There have been times when the money market was short, particularly in the panic of 1907. We had seventy-five or eighty million dollars in cash in banks at that time, and I think I may say properly, without boasting, certainly without any intent to boast, that it was our cash at that time that assisted very materially in preventing the further and dangerous demoralization which existed in financial circles in New York City.

"Now, of course, we are not called upon to maintain cash for those purposes. But, in accordance with the principles of good management, we should, I think, keep ourselves in a condition that will enable us to do all the business offered that we can handle, promptly and properly, without borrowing a dollar.

"Have you ever before heard of any corporation as large as ours, or any very large corporation, that has not borrowed money from time to time? Do you think our Corporation would be in as good condition as it is if we had to borrw money at the present time, like some of the other large business institutions which are paying seven or eight per cent for their money? If we borrowed in the same proportion to other borrowers that our business is to their lines of business, I think, gentlemen, we would bring on a financial panic within a very short time.

"I am not criticising any others; they must decide for themselves. But I would rather have you tell me at a stockholders' meeting that you think we ought to pay a little larger dividends than to have you tell me, properly, on some other occasion, that with such a large concern we ought to have kept ourselves within prudent, conservative lines which were certain to result in adding value to your property.

No Objection to Criticism

"I do not object to these requests or these criticisms. I know how you feel. The other officers of our Corporation know how you feel, because they like dividends, too, but they do not consider that. We have 160,000 or 170,000 stockholders to protect, many of them widows and children, many of them relying on our stock for some income; we have a large and splendid organization comprising some 260,000 to 300,000 men, depending upon the times and the conditions and the circumstances.

"During the war we were called upon by the officials at Washington to furnish about 60 per cent of the steel necessary for the military requirements of our Government and its associates in the war; we had to make rapid extensions, sometimes had to extend credit; we even had to diversify products and establish new lines; we were investigating, through our technical experts, the development of products for war uses, and we never failed the Government. We did it for two reasons; first, because it was the proper and loyal thing to do; and second, because the life of this Corporation depended upon the life of the Government. And the winning of the war was necessary, in our opinion, to maintain the life of the Government.

Cannot Look into Future

"Gentlemen, there is another thing we cannot overlook. We know pretty well what has happened in the past, we know what is happening now; but we cannot make an accurate prognosis for the future. Consequently we must be prepared so far as we can. Now there is more or less social disturbance in this country. There has been a bold, deliberate, underhanded movement instituted by people who are not loyal to the principles of our Government. They have met with considerable success. Of course, those in charge seek to bring about a revolution, to precipitate an industrial strike and to secure the co-operation of a very great number of men who do not see the situation, who do not understand the purposes. And it results in strife and bloodshed and the murdering of good citizens. They are doing everything they can to create and increase the feeling of unrest. They endeavor to shut off the means of daily life, of food, of transportation, and of production which supplies the compensation and therefore the living expenses of the workmen. They endeavor maliciously to bring about trouble, to create panic, to disturb the banking situation, anything and everything which will secure financially such a feeling of unrest as may precipitate trouble brought about by people who think that anything may be better than the present conditions.

People Are Loyal

"Gentlemen, they will not succeed. At least 97 per cent of the people of this country, when they act in accordance with their own desires and judgment, are loyal to the principles of our Government. And they won't succeed because such men as you and I, the officers of your Corporation, propose to do what

they can to maintain and stabilize the conditions of the country.

"We are going to get through this because of conservatism, because of prudent management and the desire to economize. Now if one of you gentlemen should complain that we are unreasonably extravagant, that we are not economizing, you would touch a very tender spot. There is no excuse for lack of economy at the present time. That applies to it, and it applies to the Government of the United States, the administration at Washington. There is no excuse for expending, as now published six and three-quarter billions of dollars a year for the management of the affairs of this Government. (Applause.) That should be cut in two at least. It could be done. And I trust it will be done.

Business Conditions Good

"Of course, when one commences to talk on these subjects, there is no end, and I would weary you. But you are entitled to know something about our affairs. Our business conditions are good. At present they are perfectly satisfactory. I do not know what the figures for the first quarter of the year will show, because, as you are aware, they are not made up until just before they are given out to the public. But we know by observation of conditions generally, as you know by published reports, that the results of the first quarter must be very good. And so far as we can determine definitely what may happen in the future, if no unexpected or dangerous upheaval occurs, prospects are bright.

"The people of the United States never had so good an opportunity for progress and prosperity as they have at the present time. In that respect the conditions have been improving for the last year or more. We may take and maintain the leading position, industrially, financially commercially, of all the nations of the world; we have the resources, which are natural and permanent, to occupy and maintain that position.

Better to Be on Safe Side

"And in making a final decision as to what we should do at the present time under all the circumstances, I submit, my friends, that it is better to be within the limits of safety all the time. If you believe in the Corporation and its management, as you have so many times stated and have shown by your action, it seems to me you ought to be pretty well satisfied with the dividends from time to time as they are determined by the board of directors after careful consideration.

"Now I have not given you the slightest hint as to what we are going to do. Have I ever done that in advance? Do you think it would be proper to do it in advance? The board of directors might not agree with me. I have had no conversation with any of them on the subject. I am only one of 15. Consequently I do not know what we will do or when, if ever, we will do anything, but I do know that all decisions will be made thoughtfully and after full discussion and after listening and reading everything that is said upon the subject, and particularly after examining the figures and accounts knowing that whatever we do will affect you stockholders just as it affects us."

COKE INDUSTRY IN 1919

Output of By-product Fuel Exceeds that of Beehive for First Time

The outstanding features of the coke industry in 1919 were the great slump in demand that followed the armistice and a remarkable increase in the proportion of by-product coke as compared with beehive coke. According to preliminary estimates made by F. G. Tryon of the United States Geological Survey, Department of the Interior, the total production of coke in 1919, including beehive and by-product, but excluding gashouse coke, was 44,821,000 net tons, a decrease, when compared with the production in 1918, of 11,657,000 tons, or 21 per cent. The decrease was confined almost entirely to beehive coke, the production of which fell off 36 per cent. The output of by-product coke decreased only 3 per cent.

The output of by-product coke consequently exceeded that of beehive coke for the first time. In 1918 about 46 per cent of the total coke made in the United States was produced in by-product ovens and 54 per cent in beehive ovens. In 1919 the proportions were reversed, 56 per cent coming from by-product and only 44 per cent from beehive ovens. The year 1919 thus marked a turning point in the history of coke manufacture in the United States.

Used in Iron Making

The blast furnaces are the great customers of the coke industry. In 1918 they consumed 45,704,000 net tons of coke, or 81 per cent of the total output of beehive and by-product coke, combined. In 1919 the production of pig iron fell off 22 per cent and the demand for coke declined in proportion. The reaction was especially felt by the producers of beehive coke. With the growth in the output of by-product coke, the beehive coke industry is likely to become more and more an auxiliary source of fuel, carrying the peak load in times of extreme activity and correspondingly restricted in times of depression. The post-war slump in the demand for beehive coke began to be seriously felt about March 15, and reached its lowest point in May. Thereafter production slowly recovered, only to be further interrupted by the steel workers' strike and the coal strike. As a result the production of beehive coke fell off 36 per cent in 1919. The total output in 1919 is estimated at 19,650,000 net tons.

The total output of coke made in by-product ovens in 1919 was 25,171,000 net tons, a decrease, as compared with 1918, of 827,000 tons, or 3 per cent. The increase was general and affected all States except New Jersey, Ohio and Pennsylvania. The effect upon production of the decline in demand for by-product coke was largely counteracted by the completion of new plants. The rate of production was higher during January, February and March than during the remainder of the year. During the last quarter the output suffered, as did that of beehive coke also, from the combined effects of the steel strike, which restricted demand, and of the coal strike, which curtailed the supply of coal.

By-Product Extensions

During 1919 there were completed and put in operation 1228 new by-product ovens, of which 718 were at new plants and 510 were extensions at existing plants. One new State, Rhode Island, entered the ranks of by-product coke producers in January, when the Providence Gas Co.'s plant was completed. During the year 128 ovens were either abandoned or were so rebuilt as to be classed as new ovens. On Jan. 1, 1920, there were in course of construction 853 ovens, which were scheduled to come into operation by July 1, 1920.

The maximum capacity of the by-product plants has been estimated at 27,000,000 net tons of coke at the beginning of 1918, 33,700,000 tons at the beginning of 1919, and 39,500,000 tons at the beginning of 1920.

Estimated according to the quantity of by-product coke produced in 1919—25,171,000 tons—the quantities of by-products recovered during the year amounted to 668,200,000 pounds of ammonium sulphate or equivalent, 251,000,000 gallons of tar, 84,800,000 gallons of crude light oil, and 367,700,000,000 cubic feet of gas.

The above statements are condensed from a 6-page review of the coke industry in 1919, published in mimeographed form, which may be obtained free upon application to the Director, United States Geological Survey, Washington.

Publication of *Sheet Metal Products*, a monthly bulletin issued by the National Association of Sheet Metal Products Manufacturers, St. Paul, Minn., has been renewed with the April number. This is the first issue to be published by the association since December, 1917.

Sheet Steel Plant to Be Built in Indianapolis

J. J. Beck, superintendent of the sheet mill department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been chosen vice-president and general manager of the Chapman-Price Steel Co., Indianapolis, which is developing plans for the erection of a sheet steel plant. Lief Lee, chief engineer of the Sheet & Tube company, will be consulting engineer, directing construction of the Chapman-Price company, though retaining his position at Youngstown. Edward S. Plott, turn foreman for the Sheet & Tube company, will be superintendent of the Indianapolis works, in immediate charge of production.

The Chapman-Price Steel Co. is capitalized at $1,500,000, divided into $1,000,000 of common and $500,000 of preferred. Common stock in the amount of $100,000 has been set aside for subscription by employees.

The original installation will consist of four sheet mills, with an additional four units to be added later. The plant will be electrically driven. It will be operated in connection with a galvanizing works, which the Chapman-Price company has maintained for 10 years. The output, which will consist of black and galvanized sheets, will be used within the organization.

The rolling mill will be the pioneer in that line of industry in Indianapolis. A number of rollers, heaters and other members of the crew have already been secured in the Youngstown district. Mr. Beck will be the chief operating official. He has been with the Sheet & Tube company for 17 years.

Increased Production Convention of Chamber of Commerce of United States

WASHINGTON, April 19.—The official program for the eighth annual meeting of the Chamber of Commerce of the United States at Atlantic City, April 26 to 29, has been completed. The meeting has been designated as an "Increased Production Convention." The general subject of increased production has been divided into sub-topics.

There will be a general business meeting of the Chamber of Commerce on April 26, with committee reports and an address on the International Chamber of Commerce by John H. Fahey, chairman of the General Organization Committee. There will be a meeting that evening of the National Committee on European Finance, of which James S. Alexander, president National Bank of Commerce, New York, is chairman.

Group meetings will be held on April 27, the different groups including railroads, shipping, cost accounting, foreign commerce, finance, domestic distribution, and the business press.

The first general session of the convention will be held in the evening of April 27, with speakers including Secretary of Commerce Alexander; Daniel C. Roper, former Commissioner of Internal Revenue, and George E. Roberts of the National City Bank, New York.

The topic scheduled for the general session on the morning of April 28 will be "Transportation in Relation to Production," with George A. Post, president Standard Coupler Co., New York, and chairman of the Railroad Committee of the Chamber of Commerce of the United States, leading the discussion on railroads; George M. Graham, general manager Pierce-Arrow Co., Buffalo, on "Highways," and Admiral Benson, chairman of the Shipping Board, on "Merchant Marine."

The subject of industrial production will be taken up also on April 28, with Charles F. Lang, president Lakewood Engineering Co., Cleveland, as chairman. Among the topics of discussion will be "Standardization of Products," and "Increased Use of Labor Saving Machinery as Aids to Increased Production," and "Industrial Relations from an International Viewpoint," and "Increased Production to Decrease the Cost of Living."

Secretary of Agriculture Meredith will discuss "Agriculture in Its Relation to Production" on the evening of April 28.

The subject of "Labor in Relation to Production" is scheduled for consideration on the morning of April 29, with Matthew Woll of the Executive Board, American Federation of Labor, as one of the speakers. Charles Nagel, of St. Louis, former Secretary of Commerce and Labor, will discuss "Immigration in Relation to Production" at the same session.

Reports of the committee and election of directors of the Chamber of Commerce and adoption of resolutions will take place on the evening of April 29.

The Magnesite Industry in 1919

The production of magnesite in the United States in 1919 fell off about 30 per cent but was nevertheless greater than in any year prior to 1917. California produced 42,000 tons of crude magnesite, or about one-half the production in 1918. According to R. W. Stone, U. S. Geological Survey, producers in Washington shipped about 55,000 tons of dead-burned magnesite, which is equivalent to about 120,000 tons of crude magnesite, or 20 per cent less than in 1918. The output of crude magnesite in 1919 was therefore about 162,000 tons. The material shipped from Washington went to manufacturers of refractory wares and to steel mills east of the Mississippi River, except about 500 tons that was distributed in Montana, Washington, California and Texas. It was expected that receipts of foreign magnesite would practically terminate the domestic industry. The imports, however, were not received as expected, and the demand for magnesite for refractory and plastic wares had to be supplied from domestic sources.

The Northwest Magnesite Co., Chewelah, Wash., was the largest producer in the United States and made some shipments during each month in the year. Its shipments were smallest in May and June but increased rather steadily to the end of the year, and are still large.

The imports of magnesite in 1919, reported by the Bureau of Foreign and Domestic Commerce, comprised 6,381 net tons of crude and 9,471 tons of calcined magnesite.

Drop Forge Meeting at Atlantic City

A list of papers to be read at the seventh annual convention of the American Drop Forge Association at the Marlborough-Blenheim Hotel, Atlantic City, N. J., June 17, 18 and 19, has been announced by A. W. Peterson, secretary of the association. It is as follows:

"Relative Cost of Operation of Steam and Board Hammers," by R. T. Herdegen, Dominion Forge & Stamping Co.

"Forge Shop Lubricating System," by Harry Johnson, Ingalls-Shepard Forging Co.

"Use of Forging Press and Upsetters," by Mr. Hopkins, Atlas Drop Forge Co.

"Powdered Fuel."

"Apprenticeship in the Die Room," by Mr. Saylis, Billings & Spencer Co.

"Necessary Chemical and Physical Characteristics of Die Blocks," by W. C. Peterson, Packard Motor Car Co.

"Forge Shop Finances," by Lee Wellington, Scoville-Wellington Co.

"The Place of Laboratory and Testing in the Forging Business," by Professor Nelson, Wyman-Gordon Co.

"The Company Store," by Edgar E. Adams, Cleveland Hardware Co.

"Heat Control in Furnaces," by Dr. W. N. Best, New York.

"Accident Prevention in the Forge Shop," by G. A. Kuechenmeister, Dominion Forge & Stamping Co.

A certificate of appreciation for services rendered has been awarded by the War Department of the United States to the J. G. White Engineering Corporation, New York.

Falcon Steel Co., Niles, Ohio has appointed McClernan & Co., Chicago, as its representative in the Chicago district.

The Concrete Steel Co., which built a branch plant in Birmingham, Ala., in 1919, has decided to make plant extension at a cost of $150,000.

Annual Meeting of the Iron and Steel Institute

The annual meeting of the Iron and Steel Institute will be held in London, England, May 6 and 7. The retiring president, Dr. Eugene Schneider, will induct into the chair the new president, Dr. J. E. Stead, and the Bessemer gold medal will be presented to Harry Brearley, Sheffield. The session on Friday, May 7, will be adjourned to May 14, when a final meeting will be held at Mappin Hall, Sheffield.

The following is a list of the papers which it is expected will be submitted:

Presidential address.

"Direct Current Compared with Three-Phase Current for Driving Steel Works Plant," by C. A. Ablett.

"Note on the Ball Test," by T. Baker and T. F. Russell.

"British Blast Furnace Practice," by F. Clements.

"The Utilization of Titaniferous Iron Ore in New Zealand," by J. A. Heskett.

"Some Defects in Electro-deposited Iron," by W. E. Hughes.

"Iron Portland Cement," by E. H. Lewis.

"Practical Notes on the Design and Treatment of Steel Castings," by G. F. Preston.

"The Valuation of Ores and Iron-making Material," by C. H. Ridsdale.

"The Distribution of Phosphorus in Steel Between Points Ac1 and Ac3," by J. H. Whiteley.

"Notes on Slag Conditions in Open-Hearth Basic Steel-making Practice," by J. F. Wilson.

"Chemical and Thermal Conditions in Blast Furnace Practice," by H. E. Wright.

"The Reduction of Silicon from the Slag in the Acid Open-Hearth Process," by B. Yaneske and G. A. Wood.

The following papers, it is expected, will be submitted at the Sheffield meeting, May 14:

"Effect of Initial Temperature Upon the Physical Properties of Steel," by J. H. Andrew, J. E. Rippon, C. P. Miller and A. Wragg.

"The Properties of Iron-Chromium-Carbon Steels," Part I, Thermal Analysis, by C. A. Edwards, H. Sutton and G. Oishi; "The Properties of Iron-Chromium-Carbon Steels," Part II, "Effect of Heat Treatment on Electrical Resistivity," by C. A. Edwards and A. L. Norbury.

"On the Structural Constitution, Hardening and Tempering of High-speed Steel Containing Chromium and Tungsten," by K. Honda and T. Murakami.

"The Structure of Some Chromium Steels," by J. H. G. Moneypenny.

"The Effect of Various Elements on the Electrical Resistivity of Iron," by A. L. Norbury.

"Brittleness of Nickel-Chrome and Other Steels." Part II. By F. Rogers.

The autumn meeting will be held at Cardiff by invitation of the Ironmasters and Steel Manufacturers of South Wales and Monmouthshire, on Sept. 21 and 22.

Canadian Consolidation Nearing Consummation

TORONTO, April 19.—Definite announcement is expected within the next three or four weeks of the long-expected consolidation of Canadian steel, coal, shipping and shipbuilding enterprises, which entered its initial stage of development some months ago, when English interests secured control of the Dominion Steel Corporation. For some weeks past, negotiations have been in progress for the merging of the two principal units in the consolidation, the Nova Scotia Steel & Coal Co. and the Dominion Steel Corporation and matters, it is understood, have now reached a stage where but details have to be disposed of. Consultations have been held in this city during the past week between officials of the two enterprises named, and further negotiations are to be continued at New York. It is understood that a new holding company is in process of formation to take over the several properties concerned, including the Dominion Steel Corporation, the Nova Scotia Steel & Coal Co., Canada Steamship Lines, the Halifax Shipbuilding Co., and one or two other enterprises. Additional capital of substantial volume will be required to carry out the plans of the new interests. The proceeds of such new financing, which is estimated at between $20,000,000 and $25,000,000, will be devoted to the improvement and extension of the properties of the several component units of the big consolidation in order to place the latter in a position to go energetically and successfully after an export trade in a way heretofore impossible.

War Contracts Liquidated

WASHINGTON, April 20.—War contracts liquidated thus far by the War Department total 18,860 formal contracts valued at $1,548,349,000, and 5385 informal agreements valued at $1,231,624,000. It has cost $354,962,000 to liquidate these contracts. In addition, partial payments amounting to $58,284,000 have been made on other contracts, making a total paid in liquidation of $413,246,000.

There are 2469 remaining to be liquidated. The value of these so far as is known is $1,164,396,000. The value of contracts liquidated totals $2,779,973,000 on which a saving of 87 per cent was effected by their cancellation.

Total sales of surplus supplies of the War Department have amounted to $764,506,844. Additional material valued at $42,096,148 has been transferred to other departments at cost price, making a grand total of $806,602,992 sold and transferred.

Pardee Steel Corporation

The steel department of the C. Pardee Works, which has operated an open hearth steel plant consisting of four furnaces, a 34-in. blooming mill, two bar mills and a turned and polished and cold drawn shafting plant at Perth Amboy, N. J., has been taken over by the Pardee Steel Corporation, recently incorporated in the State of Delaware. The new company will continue along the same lines as the C. Pardee Works and will be under the management of George Graham Bell. The officers are the following: President, Clarence M. Brown; vice-president, George Graham Bell; secretary, K. C. Acton; treasurer, J. Newlin Brown. The directors are: William L. Clause, chairman board of directors, Pittsburgh Plate Glass Co.; Wilson A. Shaw, chairman board of directors, Bank of Pittsburgh; Wilson A. Campbell, secretary and treasurer Vulcan Crucible Steel Co., Aliquippa, Pa.; Ralph H. Watson, assistant general superintendent Carnegie Steel Co.; Raymond Pitcairn, executor estate of John Pitcairn, Philadelphia; George Graham Bell, and Clarence M. Brown.

Sales of Government Surplus

WASHINGTON, April 20.—The Director of Sales of the Surplus Property Division of the War Department reports the sale of 23 tons of nickel steel bars at $120 per ton, to the Moline Plow Co., Rock Island, Ill. Besides this award approximately 14 tons of hexagon steel screw stock was sold to Morris W. Crew, 2109 Broadway, New York; 20 tons of the same commodity at $106 per ton, to Brown Co., Syracuse, N. Y.; 2½ tons at $70 per ton, to Oliver H. Van Horn Co., 518 Kemp Street, New Orleans; 20 tons of chrome vanadium bars at $80 per ton went to Morris W. Crew, New York; 11 tons of steel angles to the Niagara Sprayer Co., Middleport, N. Y., at $85 per ton and 9 tons of steel forgings at 0.015c. per lb., to the MacGregor Instrument Co., Needham, Mass.

Scrap Dealers' Troubles

YOUNGSTOWN, OHIO, April 19.—Dealers in scrap iron and steel and other metals in the Mahoning and Shenango Valleys have been harder hit by the strike of switchmen and yardmen than by any preceding labor disturbance, for the reason that shipments are impossible. Since the beginning of the disturbance scarcely any scrap has been shipped. Extensive yards handle thousands of tons of material every month, supplying not only Valley steel makers, but producers in other parts of the country. Sorting, classification and baling require the services of many men, who have been forced into idleness.

BELGIUM SHORT OF FUEL

Leading Steel Plants Supply Only the Home Market

BRUSSELS, BELGIUM, April 2.—(*Special Correspondence*)—The iron and steel industry in Belgium is still confronted with the shortage of coal and coke, though there is a ray of hope in the recent announcement that the Belgian Government has just reached an agreement with the French Government whereby Belgium is to receive from France a part of the coal supply from the Ruhr. The coal is due France through the peace treaty, but Belgium will allow France to use a part of its railroad system for its transportation. Belgium will receive 90,000 tons by rail and 100,000 tons by water in April; in May, 90,000 tons by rail and 125,000 tons by water; in June, 90,000 tons by rail and 150,000 tons by water. Although Belgium is still waiting for other coal and coke which Germany agreed to deliver, the supplies conceded by France will permit of the blowing in of several blast furnaces.

The demand upon Belgian iron and steel plants has been without precedent and production quite inadequate. With the comparatively limited transportation and the scarcity of raw materials, prices continue to go upward. While the industry received with satisfaction the news of the coal that is to come from the Ruhr, there is a disposition, in view of experience and the general unsettled conditions in Germany, not to be too enthusiastic. Coke continues to be seriously lacking and if one calculates the number of blast furnaces in Belgium ready to be started or which are already operating and the quantity of coke that has been placed at their disposition the percentage is hardly 20 or 25 of the quantity necessary for regular operation. This explains why the pig iron production of February was only 25.7 per cent of the average monthly production of 1913.

Following is a list of comparative prices, in francs, for April 1, 1913, and April 1, 1920:

	April 1, 1913. Metric Tons.	April 1, 1920. Metric Tons.
Pig, Luxemburg, for casting	90	950–1000
Pig, Luxemburg, for puddling	79	....
Pig, Charleroi, for puddling	84	....
Pig, Thomas	89	900–925
No. 2 iron, at Antwerp	141.25	1350
No. 3 iron, at Antwerp	143.75	....
Steel bars	141.25	1350
Beams	142.80	1350
No. 2 iron, at Belgian railroad depot	165.00	1300
No. 3 iron, at Belgian railroad depot	167.50	....
Iron sheets, No. 2, for export	161.25	....
Iron sheets, No. 3, for export	162.50	....
Thomas steel sheets	158.75	1550
Sheets of homogeneous metal	170.00	1650
Steel rails	150.00	1300

These prices are rather nominal than real, especially for export. The big iron and steel works are now exporting practically nothing, their production being sold in the country. Present exports of finished products are due to the small rolling mills which buy semi-finished material in the market. The production of merchant iron by these rolling mills in February was greater than in February, 1914, before the war. These mills are having difficulty procuring semi-finished products, since the steel works themselves are so short of them that they must buy blooms, slabs, etc., in Lorraine and Luxemburg, this being the case as to Ougree-Marihaye and Cockerill, to say nothing of La Providence company, which, because of the total destruction of its steel plant, can only operate on purchased half-finished products. In any case, it may be affirmed that the tonnage exported by the steel plants is greatly reduced. The semi-finished exports for the first two months of 1920 were 683 tons of ingots, 135 tons of blooms and no billets—in all a total of 818 tons.

The Minister of Economic Affairs has officially transmitted to Belgian coal mines the increase in coal and coke prices, which per ton are: Domestic coal, 7 francs; industrial coal, 7 francs; boulets, 7 francs; coke, 10 francs 50 cent.; briquettes (provisionally), 7 francs 50 cent. Directors of a number of coal mines are not satisfied with the new prices fixed by the Government. The conflict is especially strained as regards the Belgian coke syndicate, which demanded an increase of 12 francs a ton and refuses to bill its sales otherwise.

At the Usines de Thy-le-Chateau a blast furnace has just been put into operation as well as a 330 millimeter rolling mill. The steel works will begin operating soon.

The Usines de Monceau-Saint-Fiacce have just started a converter. The resumption of the rolling mills will take place soon. The reconstruction of this plant which was devastated by the Germans is going on rapidly.

At the Miniere and Metallurgie de Monceau Saint Fiacre the steel works has just begun operating. A blast furnace of 200 tons will be working before three months and the second blast furnace will be reconstructed and completed in September.

The Societe Anonyme d'Athus-Grivegnee has begun operating a blast furnace. The Societe Esperance-Longdoz has re-established a second blast furnace. The Societe des Forges et Laminoirs de Regissa has resumed activity. Sambre and Moselle has relighted one of its blast furnaces.

The Societe de Vireux-Molhain, in which Ougree-Marihaye has considerable interest, is about to start a blast furnace. At the Usines Metallurgiques of Hainaut a third blast furnace has been relighted. The capital of the company has been increased from 14 to 18 million francs.

The Usines Basset at Houdeng-Coegnies, an English company, whose plant was entirely destroyed by the Germans, has a proposal to create a new company with American money at a capital of 4,000,000 francs.

Ougree-Marihaye has subscribed for 8,000,000 francs of the increase of capital, from 4 to 16 million francs, of the Societe J. Sichel et Cie, Luxemburg.

Scarcity of Manganese Ore and Ferromanganese in Great Britain

The manganese ore situation in Great Britain, and consequently the ferromanganese, are better understood by the following extracts from the two latest issues of the London *Iron and Coal Trades Review* to reach this country:

In manganese ore the position is even less satisfactory than in recent weeks, the scarcity of tonnage handicapping the importers. Supplies in India are limited, while stocks at Bombay are virtually exhausted. The price for Indian ore to the United Kingdom has firmed to about 4s. per unit, while small quantities of Caucasian ore have been offered at about 3d. less.

Daily inquiries are received for a large tonnage of ferromanganese, but the works cannot entertain them for months. Considerable premiums are being paid for prompt delivery. In view of the shortage, it is suggested that the various grades of silicomanganese alloys be used where it is impossible to obtain ferromanganese. A quantity of silicomanganese, showing 20 to 30 per cent silicon and 50 to 60 per cent manganese, has been sold at about £42 per ton, delivered British port. Other grades vary a little in price, according to the analysis. For ferromanganese the official minimum remains at £32 10s. for the home trade, and £35 for export, but for the latter trade as much as £50 has been refused. There is some doubt as to the exact figure being quoted American consumers for English material, but for August shipment there is one quotation of $155, c.i.f. tidewater, while there have been a few small sales lately at $170 c.i.f. for shipment during the second quarter.

Large Fairbanks-Morse Foundry Started

Ground has been broken for the $2,000,000 addition to the plant of Fairbanks, Morse & Co. in Beloit, Wis. The new buildings include a pattern shop, 80 x 230 ft., and a foundry, 455 x 550 ft. The foundry will employ 1200 men and will contain four cupolas, operating alternately in tandem, two one day and the other two the next. The capacity has been estimated at 500 tons of iron a day. The foundry is the first of two foundry units to be built. When the second is added, the dimensions of the entire structure will be 550 x 900 ft. C. A. Hardy, Railway Exchange Building, Chicago, is the designing engineer.

The stockholders of the Pierce-Arrow Motor Car Co., at Buffalo, Tuesday, reelected the company's present directors, eight in number. The vacancy carried by the recent death of Charles H. McCullough was not filled. No other action was taken.

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No "Panic" in Sight

It would be well for those who talk of a "panic" seizing the people of the United States in the not distant future, and those who listen to the talk, to see that they understand the terms employed. A panic involves sudden fear, sometimes unreasoning fear. If a panic were universally predicted and believed in it could not occur, by the very nature of things.

There are different kinds of fears, likewise different kinds of panics. The United States has experienced only one kind of a panic, but many of them; therefore it should not be assumed that when panic is mentioned the one particular kind of panic is the only kind that could occur. Our panics have been money panics, and the Federal Reserve system, put in operation late in 1914, is held to be an almost certain preventive of money panics. There has been much criticism of bankers because of loose use or interpretation of terms, the critics asking why bankers say the present banking system should prevent panics and at the same time say there is going to be a panic. The point is simply that a purely "money panic" may be avoided, while another kind of panic could still occur.

The explanation of why we have had money panics exclusively when there are various kinds of panics is simply that when there is an attack by economic laws or by whatever one chooses to call the attacking force, the weakest thing yields first, and in times past our money system was very weak. If the weak line of defense has been removed to the rear the attack falls upon the next line of defense.

Panics have usually been followed by periods of industrial depression, but it has not been established that the panic is the cause of the depression. There are strong arguments for holding that recognition that an industrial depression is coming is the cause of the panic.

There is much literature on panics and depressions, but a great deal of it is more or less confusing, and the principles deduced are in the main difficult of application. The testimony of some of the historical cases reviewed is made of little practical value for the future by reason of world events being interwoven as the cause, when similar events would not occur again. A difficulty which some writers have failed to handle adequately is the separation of real evidence from evidence that is manufactured by the panic and depression itself. In particular, there is the obvious circumstance that a panic and an industrial depression are accompanied by a great decline in commodity prices, the decline making the prices prevailing prior to the panic seem high. Hence the observer is disposed, in the retrospect, to conclude that prices were "too high," whereas instead of unduly high prices having produced a depression it may be a case of a depression causing prices to become unduly low.

On one point, however, practically all the observers are agreed that undue expansion in industry by the conversion of too much liquid capital into fixed capital, by way of productive enterprises being expanded beyond the ability of the public to patronize them continuously, is the most important single cause of industrial depressions. If so, it is a reasonable inference that a panic, or sudden fear, occurs when the unfortunate fact is realized. The case is quite like that of a man who buys a house, difficult of resale, and suddenly discovers he is unable to pay all the taxes and employ all the servants necessary to keep the house going.

If one is willing to take this viewpoint, there can be no question about what he will see. He will observe that the very last thing that threatens the United States is an industrial depression. We have not spent too much money on railroads, but altogether too little. We have not erected too many dwelling houses, but on the contrary almost every other man is feeling keenly the effects of there being too few dwelling houses. We do not have too many hotels and office buildings, the reverse being obviously the case. There are not too many power plants, but too few. We are wasting a large part of the coal we use, and are letting vast quantities of water power go idle, because we have not lived up to our progress in engineering knowledge by installing better methods of coal consumption and by harnessing the water power.

If there is to be no industrial depression, there cannot be any panic produced by sudden realization that an industrial depression is about

to come. Eliminating this cause of panic, also the cause resulting from a weak and inefficient banking and currency system, such as we used to get along with in fair weather, there remain some panic possibilities. Commodity prices and wage rates are very high indeed compared with the historic averages, but men are very freely paying the commodity prices and the wage rates, seeking to buy more material than is available and hire more men than there are. These rates may be wrong, and indeed most observers insist that they are. A suddenly acquired fear that too much is being paid, resulting in less buying and less employing, would mean a panic, for the country would move practically as a unit. Such a panic would promptly produce a readjustment. Many who assert vehemently "There will be no panic" at the same time believe there will be a readjustment or what is often popularly called a "shake-out." It is chiefly a matter of nomenclature or definition of terms. The results of a readjustment would be very beneficial. There being no basis, in overexpansion in construction work, for a prolonged industrial depression, business would be fortified to go ahead with greater physical activity and more confidence.

Judge Gary on Shop Committees

Judge Gary's opposition to the "one big union" plan of organizing the industries of the country will be generally approved, not only by employers but also by fair-minded employees; but the same cannot be said for his attitude in opposition to shop committees. Judge Gary describes the latter as a plan "whereby groups of men may present to the management for discussion and decision any questions relating to employment conditions." He adds, however, "We have made diligent investigation of these matters. Up to date we think no plan better or more satisfactory to employees than our own has been tried." Judge Gary then describes the Steel Corporation plan as follows:

"Any employee or any self-appointed group of employees from any department throughout our large and diversified works and activities is at liberty at all times to present to the respective foremen, and, if desired, to the higher appointees or the officials, all questions involving the interests and welfare of both employee and employer for discussion and disposition. In this way fair and satisfactory adjustments are made."

Judge Gary does not bring out the difference between the truly representative system, carefully arranged so that all matters of complaint can be considered, and a system, or lack of system, by which an employee or any self-appointed group of employees may act. The difference is important, for the former encourages and insures freedom of action to an extent that is not possible under the latter.

Measured from the standpoint of failure or success, no system of adjusting grievances can be declared to be established to the extent of functioning satisfactorily. This certainly is true of the old method, as demonstrated by countless strikes, although it is true, as Judge Gary says, that there is a friendly sentiment existing to a large extent among employees of the Steel Corporation. The representative systems adopted by the Colorado, Youngstown, Bethlehem, Midvale, Lukens, Inland, and other steel companies had not been in effect long enough last September to be considered established, and hence the test of the steel strike was not conclusive. Officials of these companies have declared that while disappointed they are not discouraged, and they intend to continue with their present methods, improving them as may be necessary from time to time.

While Judge Gary thinks no plan better than that of the Steel Corporation, which has devised no machinery for the expression of the employees' views on questions which concern them, his intimation that "a studious, thoughtful, fair-minded, intelligent general public is at present considering these vital questions" gives assurance that Steel Corporation officials have not closed their minds on the subject. The outcome of the divergent policies of the Steel Corporation and the various independent steel companies will be watched with the deepest interest in the critical period that lies just ahead. It should be possible in time to make a definite appraisal, on the one hand, of employee representation under company co-operation and, on the other hand, of the various methods by which the Steel Corporation has sought to express its good will to its employees, without providing the means for an expression from them either individually or collectively.

Supply and Demand

Of course it is no new thing for men to "change their tune" when circumstances change, but of late there have been particularly striking illustrations of the tendency. It is not so very long ago, as the memory of man runs, that there was much outcry against wicked people, whether organized in the form of a "trust" or not, who would try to throttle that great law of "supply and demand." By all means, the critics shouted, let the law of supply and demand operate, for therein lies safety from oppression. Nowadays the outcry against the high cost of living, and against high prices generally, is really an outcry against operation of the law of supply and demand. It depends chiefly upon whose ox is gored.

It has even become wicked for people to bid for the things they want and have the money to pay for. They make everybody, themselves included, pay more for goods than the critics think ought to be paid, and it is very objectionable all around. After all it is nothing but the law of supply and demand. If it is good to let the law work out at one time, why not at another? There have been times in the past when supply exceeded demand, when manufacturers, wholesalers and retailers could not sell at a profit, and when men willing and eager to do a good day's work could not get employment. There was much less preaching then that somebody ought to do something. Slowly and painfully the thing was allowed to work itself out, until prosperity returned. Correction of a situation like the present occurs much more speedily, yet there is much more im-

patience than at times in the past when matters had gone to the other extreme.

Much of the talk is distinctly disingenuous. Sellers appear to complain about their high costs when the psychological result of their talk is to spread the feeling that this is all in the day's events, that we must put up with high costs, even rising costs, and the natural result is for the hearers to seek means whereby they can advance their selling prices, and thus there is another of those "vicious circles" which have become quite commonplace. In the majority of cases the seller is merely attempting to boost his selling prices, using "high costs" as a convenient excuse.

The law of supply and demand, once so ardently worshipped in quarters that now cut it dead, is operating, and is going to continue to operate. In one respect its operation is more vicious in a case like this than in the case of supply exceeding demand. When there is depression, costs decline and eventually commodities become so cheap that a good and substantial basis is reached for a revival of activity. At a time like this, with demand exceeding supply, there must eventually be a decline in costs and then the advent of lower priced goods will cause timidity instead of confidence. What the country needs is activity, not in the passage of dollars, but in the passage of goods. It is not the volume of money turnover but the volume of turnover in goods and actual work that counts.

A particularly unfortunate feature of the present situation is that many sellers of goods have little confidence in the more distant future of their market and hence are moved to squeeze all they can out of the present. They feel that a break is coming at some time, hence there is no particular advantage in stabilizing their present market.

More progress will be made towards a stable and prosperous situation if men refrain from ranting about profits and profiteers and recognize frankly that the law of supply and demand is operating and is going to continue to operate. If the cost of living is to be reduced supplies must be increased and demand decreased. It is a matter of goods, not talk.

The recovery in British iron and steel exports, which was first distinctly noticeable late in 1919, continued in February. The total for the month was 231,065 tons, only a little less than that for January, and represents the largest February movement in the last six years except that of February, 1916. A feature of the February exports this year is the increase in pig iron, despite the scarcity for even home consumption, the amount being 60,990 tons, against 42,790 tons in January, and 30,574 tons and 15,840 tons in January and February, 1919, respectively. In 1913, the monthly average of pig iron exports was 78,770 tons, or about 30 per cent above the February rate. There has been a marked increase of late also in galvanized sheet exports. For January and February this amounted to nearly 30,000 tons each month against only about 2200 tons per month for the first two months in 1919. In 1913 these exports were 63,500 tons per month.

Aluminum Steel

New uses for aluminum are constantly appearing. Besides the important rôle of this metal in recent years in the airplane and automobile fields, particularly in special alloys with other non-ferrous metals, a new one seems to be assured, for aluminum steel has appeared on the market. It is an alloy of iron with about 14 per cent aluminum and is being produced as castings from a special type of rocking electric furnace at a steel foundry in Detroit. These castings are offered as especially suitable for pots and boxes for carburizing, because of the resistance of the alloy to corrosion and disintegration by heat and chemicals. These qualities are combined with lightness.

Another new and striking aluminum alloy being offered on the market is a combination with silicon. Aluminum silicide is said to possess great strength with lightness and an important use is its substitution for steel or iron in crankcases for automobiles and similar parts. It also is made electrically.

These two interesting developments are indicative of the trend in special steels and alloys. Electricity, which first made possible the isolation of aluminum and silicon, has now become the medium of their combination in these new alloys, with the probability that others are to come. Thirty years ago a curiosity, aluminum is now not only a commercial metal with a long list of uses but a valuable alloying element of growing promise.

The Spirit That Breaks Strikes

The splendid spirit of the volunteer railroad workers manifested during the past week has had a cheering effect upon the country, for it has shown that the people of the United States are not yet ready to surrender to the strikers.

From many directions have come men who have given their services to operate trains and have done much toward putting an end to the strike of railroad employees, which aimed to throttle community life and for days seriously crippled many industries. One of the most interesting examples of the value of volunteer service was furnished in the running of commuters' trains from various suburban towns in New Jersey to New York. Business men came forward freely, including former soldiers who had had valuable experience in France, and within a day or two the change in the situation was most gratifying. The strikers were disheartened and late in the week came back in droves to their jobs.

The service of the college boys is not to be overlooked. It was especially pleasing for the reason that for a number of years the teaching of more or less socialistic doctrines by some college professors has aroused suspicion that many institutions of higher learning were becoming unsound from the standpoint of economics. So great was the rush from Stevens Institute, Hoboken, to the railroads, that a vacation of indefinite duration was declared to last until the students were no longer needed on the trains. The attitude of the students shows that despite all impressions to the contrary, the American college boy has no sympa-

thy with the unjust strike, and can be depended upon to do his part to protect the community against a hold-up in the name of labor.

The movement of the New York Chamber of Commerce to organize a Citizens' Protective Union to combat all unjust strikes has met with prompt response. The chamber is listing and classifying all those desiring to serve in the event of a national emergency, and President Marling points out that, "The ending of the present strike will not mark the disappearance of all need of preparation to meet such an emergeny." Whether formally organized or not, the American people have shown that the spirit which will not allow strikes to spread unless they are based on reason still prevails in this country.

CORRESPONDENCE

Killing the Goose that Lays the Golden Egg

To the Editor:—Within the past few weeks several large cotton mills in Philadelphia have been sold. The cases were not the usual ones of "going" concerns of long established reputation and in good financial condition simply changing hands, or passing into combinations with other concerns engaged in similar production. It is told on excellent authority that all the machinery of these mills is being dismantled and packed for shipment, and that much of it has already gone from this country to be set up as quickly as possible in a foreign land, there to be operated by foreigners under more favorable conditions with respect to labor.

Attractive offers to purchase were made through agents of the foreign capitalists, who did not themselves appear in the transactions; but it is pretty well known that Japanese merchants are the real buyers and it is suspected that the Japanese Government is financing the deals. These are straws which show the way that "trade winds" are now blowing and, if continued, will in time—perhaps not a long time—have a disastrous effect upon American manufacturing industries, especially upon labor.

Here were mills that have been continuously in operation for many years and in all human probability would have continued indefinitely to employ hundreds or thousands of men and women who have been trained in these special occupations, except for one principal reason. What is that reason? In an interview with the president of one of the largest mills recently sold and now being dismantled I learned this reason.

I was told that the demands of labor, notwithstanding high wages that have been cheerfully given to meet the high cost of living, have become so intolerable that it is almost impossible to make contracts or to carry on business with any assurance of reasonable profit in the future; hence, when the opportunity came—like a bolt from the blue sky—to close out the entire industry for cash there was no other course left to pursue than to accept it. American operatives by hundreds and perhaps by thousands are thus being suddenly and unexpectedly deprived of work, and while they may find for a time new avenues of employment the time will probably come when they will find other mills similarly abandoned and a constantly growing army of out-of-work people.

Perhaps this gloomy view may be considered pessimistic, but if warning is given and taken in time by labor in this country the disaster may be averted. As conditions now obtain it certainly looks as though labor has been demoralized by high wages, with extravagant expenditures for luxuries instead of careful conservation of these fat pay envelopes against future necessities and future uncertainties. In other words, it may be truly said that labor is "killing the goose that lays the golden egg."

Strange to say, labor fails to realize that nothing is more conducive to the high cost of living than strikes. As a weapon the strike has proved on innumerable occasions to be a boomerang that injures the striker more than the stricken.

Nothing has stimulated the introduction of automatic machinery so greatly as strikes. But the purchase outright of large mills in this country and the transportation of the machinery to foreign lands, there to be set up and operated by foreigners on American methods, with far cheaper native labor, is an entirely new feature of ominous portent hitting both ways—depriving our workers of tools and assisting competition from other lands where those tools are being put into operation.

ALEXANDER E. OUTERBRIDGE, JR.

Philadelphia, April 14, 1920.

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Iron and Steel Markets

SERIOUS CURTAILMENT

Strike End in Sight, but Steel Trade Much Demoralized

Some Price Advances—Further Car Orders and Export Business in Plates

While the end of the railroad strike is in sight, the delivery of steel products is seriously disorganized and the return to normal conditions is not expected for a good many days. Buying has been much curtailed in the past week and manufacturing consumers of pig iron and of rolled steel have been compelled in many cases to shut down wholly or in part because their fuel supply was cut off.

On Tuesday the situation at Pittsburgh, Youngstown, Cleveland and Chicago blast furnaces and steel plants was but little improved. Steel production in the Pittsburgh district was probably 50 per cent of normal. The Carnegie Steel Co. was operating 29 out of 59 blast furnaces, while another producer had all its 12 furnaces still in blast. At Youngstown few of the 25 furnaces were going, and 200,000 tons of finished steel products were piled up at Youngstown district mills.

East of Pittsburgh the shut downs were less serious. Of 38 blast furnaces of the Bethlehem and Midvale companies 29 were in blast at the beginning of this week. Many isolated furnaces in Ohio and Pennsylvania have been compelled to bank for lack of fuel.

In all districts manufacturing has been on a much better scale than shipments. Thus raw materials have been worked up only to the increase of congestion in mill yards. Some steel plants are in distress for ferromanganese and the pinch there is likely to last beyond the ending of the strike.

Scarcity due to the strike has caused an advance in blast furnace coke from $10 to $11.

In the foundry trade conditions are less favorable than they were a week ago, many foundries, on account of a shortage of coke, being on the verge of stopping operations. There has been little buying of foundry pig iron, but the market continues strong. In steel-making irons the principal activity has been in the Pittsburgh district, where 15,000 tons of basic has been bought at $43, Valley, while a sale of 7500 tons of basic by a Valley furnace was made at the price prevailing at time of delivery, the buyer having declined to pay $43.50, the price named by the furnace. Bessemer has been marked up 50c. in the Pittsburgh district.

Cast iron pipe prices have advanced $4 per ton, making a total increase of $14 since Jan. 1.

An exception to the general cessation of inquiry is the effort of automobile manufacturers to contract for round lots of sheets for the second half of the year. Implement manufacturers have been trying to get under cover on bars also for the last half, but some mills have declined to quote.

A moderate amount of car business is coming along. The Union Pacific has just placed 2000 gondolas and the Chicago & Northwestern is inquiring for 500 ore cars. The Southern Pacific will build 4065 cars at its own shops.

It now develops that probably 200,000 tons of rails have been bought at $57. Meanwhile such track accessories as spikes and track bolts are moving at $4.25 and $6 for 100 lb. respectively. Of the 76,000 tons of Bessemer rails bought from the War Department some time ago about 60,000 tons have been sold for export.

Weakness in steel plates, long predicted because of the large producing capacity, is not much in evidence. While Eastern mills are not heavily booked, they are still discriminating; one mill, for example, is refusing to take more than 10 or 15 per cent of the plates as thin as 3/16 in. on a given order, and is requiring a large percentage of tank quality along with an order for ship plates. A lot of 800 tons of one size and thickness for domestic consumption brought 3.85c., Pittsburgh. Two more British shipyards have been buyers, both at 4c., Pittsburgh, one for 7500 tons and the other for 2000 tons, with 19,000 tons additional in the latter case yet to be placed. A Cleveland mill has taken 6500 tons of plates for Japan and has an inquiry for 7500 tons for export. Universal and the narrower plates are more easily obtained.

In a week rather bereft of conspicuous transactions, a fabricated steel award of 16,000 tons to the McClintic-Marshall Co., for a sugar refinery in Baltimore is prominent. Shipyard activity has caused a scarcity in rivets.

Eastern bar iron still tends upward. The small sizes of machine and carriage bolts in which there has been a sustained active demand have been advanced by a number of makers about 10 per cent.

No concern is felt over the financial market difficulties in Japan, as most of Japanese orders were entered against firmly established credits. Delayed deliveries from mills, resulting from the successive obstacles to production since late autumn, would be the more likely causes for suspensions or cancellations in the export trade.

Pittsburgh

PITTSBURGH, April 20.

It is believed that some of the optimistic reports being put out by local railroad officials as to improvement here in the switchmen's strike situation are not fully justified by the facts. An official report put out at noon by the traffic manager and general superintendent of transportation of the central region of the Pennsylvania Railroad Lines East and West, Pittsburgh being the central region, states that the situation is showing gradual improvement, but is still far from normal. At the Conway, Pa., yards of the Fort Wayne, also on the Cleveland, Pittsburgh, Erie and Ashtabula, and Pittsburgh, Cincinnati, Chicago & St. Louis divisions, the situation is bad and all freight being moved is being handled entirely by volunteer crews. How-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton	1920 Apr. 20,	1920 Apr. 13,	1920 Mar. 23,	1919 Apr. 22,
No. 2 X, Philadelphia‡	$47.05	$47.05	$46.05	$31.90
No. 2, Valley furnace†	43.00	43.00	42.00	26.75
No. 2 Southern, Cin'ti†	43.60	43.60	43.60	30.35
No. 2, Birmingham, Ala.†	40.00	40.00	40.00	26.75
No. 2, furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, eastern Pa.	44.80	44.80	44.80	29.65
Basic, Valley furnace	**43.00**	42.00	42.00	25.75
Bessemer, Pittsburgh	**42.90**	43.40	43.40	29.35
Malleable, Chicago*	43.50	43.50	43.00	27.25
Malleable, Valley	43.00	43.00	43.00	27.25
Gray forge, Pittsburgh	42.40	42.40	42.40	27.15
L. S. charcoal, Chicago	57.50	57.50	57.50	38.85
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$45.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. sheets bars, P'gh.	80.00	80.00	70.00	42.00
Forging billets, base, P'gh.	80.00	80.00	80.00	51.00
O.-h. billets, Philadelphia	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh	70.00	70.00	70.00	52.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh	4.25	4.25	4.25	2.35
Iron bars, Chicago	3.75	3.75	3.75	2.50
Steel bars, Pittsburgh	3.75	3.75	3.75	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	3.75	3.75	3.75	2.65
Tank plates, New York	4.02	4.02	4.02	2.92
Beams, etc., Pittsburgh	3.25	3.25	3.25	2.45
Beams, etc., New York	3.52	3.52	3.52	2.72
Skelp, grooved steel, P'gh.	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh	**5.00**	4.00	4.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	1920 Apr. 20,	1920 Apr. 13,	1920 Mar. 23,	1919 Apr. 22,
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	7.00	7.00	7.00	5.70
Sheets, blue an'l'd, 9 & 10	4.50	4.50	4.50	3.90
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	$37.00	$37.00	$37.00	$21.00
Carwheels, Philadelphia	40.00	40.00	42.50	23.00
Heavy steel scrap, P'gh.	*25.00*	25.50	27.50	15.00
Heavy steel scrap, Phila.	24.00	24.00	25.00	15.00
Heavy steel scrap, Ch'go.	23.50	23.50	24.50	15.75
No. 1 cast, Pittsburgh	*32.00*	33.00	34.00	18.00
No. 1 cast, Philadelphia	38.00	38.00	38.00	22.00
No. 1 cast, Ch'go (net ton)	37.00	37.00	37.50	20.00
No. 1 RR. wrot, Phila.	35.00	35.00	35.00	21.00
No. 1 RR. wrot, Ch'go (net)	27.00	27.00	27.50	15.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$11.00**	$10.00	$6.00	$3.50
Furnace coke, future	**11.00**	10.00	6.00	4.00
Foundry coke, prompt	11.00	11.00	7.00	4.00
Foundry coke, future	11.00	11.00	7.00	4.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*19.25*	19.50	18.87½	15.50
Electrolytic copper, N. Y.	*19.00*	19.25	18.50	15.25
Spelter, St. Louis	*8.15*	8.40	8.50	6.05
Spelter, New York	*8.50*	8.75	8.85	6.40
Lead, St. Louis	*8.50*	9.00	8.75	4.70
Lead, New York	*8.85*	9.25	9.00	4.95
Tin, New York	*62.25*	63.25	60.75	72.50
Antimony (Asiatic), N. Y.	11.00	11.00	11.50	6.50

The above prices are for domestic delivery and do not necessarily apply to export business.

ever, conditions are slowly getting better, and this is shown by the fact that on Thursday in the central region the freight movement East and West was 13,000 cars, Friday 15,000 cars, Saturday 17,000 cars, and Sunday 21,000 cars. The normal volume of freight from the central region is about 65,000 cars per day. In the best movement yet, which was on Monday, only about 40 per cent of normal traffic, or 26,000 cars, was moving. The yard and road men at Dickerson Run, in the Connellsville coke district, voted Monday to go back to work and the men at Haselton, Ohio, and McKee's Rocks, Pa., yards of the Pittsburgh & Lake Erie, meet to-day (Tuesday) and are expected to vote to return to work. On the Baltimore & Ohio railroad, the yard men in the Pittsburgh district, also at New Castle, Youngstown and Holloway are still out, but may vote to go back to work in a day or two. The Erie railroad reports that on Tuesday two switching crews were working at Youngstown, Ohio, and freight officials of this road believe that all their yard men will be back in a few days. There is a wide difference of opinion among railroad officials as to the effect of the decision of the Labor Board at Washington not to meet with the men while they are on strike. This course was pursued during the coal strike and had the effect of causing a quicker settlement of that strike than otherwise would have been the case. Some officials believe the same effect will be had among the striking yard men, while a few believe it will cause them to hold out longer. Even should the strike situation be pretty well cleared up this week, it will certainly take three or four weeks before railroad conditions are anything like normal again. The strike is playing havoc with operation of blast furnaces, steel works and other plants in the Pittsburgh and other nearby districts. On Tuesday this week the Carnegie Steel Co. had no less than 20 blast furnaces banked on account of the strike. It had nine idle before the strike occurred, so that to-day it is operating only 29 furnaces out of a total of 59. The National Tube Co. has one Riverside blast furnace down at Wheeling, W. Va., and two butt and one lap-weld furnaces at its Continental works in the city are idle. The company also has a large number of coke ovens idle at Lorain and Wheeling. The Jones & Laughlin Steel Co. has been particularly fortunate, all its six Eliza and one Soho blast furnace in Pittsburgh, also its five blast furnaces at Alliquippa being in operation, while all its steel works and finishing mills in Soho, Pittsburgh and Alliquippa are running. Claire and Ella blast furnaces of E. W. Mudge & Co., in the Shenango Valley, are both banked, and the blast furnace of the Weirton Steel Co., Weirton, W. Va., is to be banked this week for lack of coke. One of the two Monessen, Pa., furnaces of the Pittsburgh Steel Co. is banked for lack of coke. Other blast furnaces that have been drawing on their coke supply since the railroad strike started are about at the end and will likely bank before this week ends. Steel works in Pittsburgh district are operating at less than 50 per cent normal capacity. The Carnegie Steel Co. has several steel plants down and others are running to only 50 per cent or less. No estimate can be given now of the loss of production in pig iron or steel by the strike, but it is very heavy. The 20 blast furnaces of the Carnegie Steel Co. banked on account of the strike would make about 10,000 tons of pig iron per day. It is believed by the end of this week the situation will show much betterment, but the accumulation of freight during the strike will take three or four weeks for the railroads to clean up.

In the meantime little or no effort is being made by the steel companies to do any new business. Rather, they are concentrating efforts to get what freight they

can moved, and are trying to bring order out of the disorder caused by the strike. The money loss by the strike will run into millions of dollars which will have to be borne by the railroads, the steel companies and the strikers, the latter being least able to bear their part of the cost.

Pig Iron.—The loss in production in pig iron by the strike and the high prices ruling for coke have firmed up the pig iron market and prices on Bessemer are 50c. and on basic $1 per ton higher. A local interest has sold 5000 tons of basic for second quarter at $43, Valley furnace, and a local steel company is credited with having sold 10,000 tons of basic for second quarter to a middle Ohio steel company at that price. There are reports of small sales of basic at $43.50, Valley furnace. We note a sale of 2000 tons of standard Bessemer iron for delivery to a West Virginia consumer at $42.50, and 1000 tons of malleable at $43, Valley furnace. We also note sales of 3000 to 4000 tons of plain No. 2 foundry iron at $43, Valley furnace.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$43.00
Bessemer	42.50
Gray forge	41.00 to 42.00
No. 2 foundry	43.00
No. 3 foundry	42.50
Malleable, Valley	43.50

Coke.—At this writing no coke is moving from the Connellsville or other regions to consumers, and while the railroad situation is no doubt getting better, it will be three or four days before coke starts to move from the yards to blast furnaces. When the railroad strike started, there were hundreds of cars loaded with coke ready to be moved to consumers, and some of these cars were moved part way, a large number to the Conway, Pa., yards, but the coke never got any further. The National Tube Co. was able to move some coke itself from the ovens of the Washington Coal & Coke Co., in the Connellsville region to its Monongahela blast furnaces at McKeesport, Pa., and this enabled the company to keep its furnaces there in operation longer than otherwise would have been the case. Two or three leading coke producers expect by the end of this week to be moving furnace coke to consumers. A local blast furnace interest has made a contract for second quarter, 10,000 tons per month, at $11 per net ton at oven. Part of this coke was moved early this month, but none has gone forward for a week or more. It is estimated that coke production in the two Connellsville regions now is only 50 per cent or less of what it was when the railroad strike started, and at that time it was running about 250,000 tons per week. Output of coke for the week ended April 10 in the two Connellsville regions was 251,927 net tons, but for the week ended April 17, it was probably only about half that amount. We quote standard grades of blast furnace coke at $11 for future and prompt, and standard 72-hr. foundry coke at $11 to $12 per net ton, at oven. On contracts for second quarter, furnace coke has sold at $11 and foundry at $12 per net ton at oven.

Billets and Sheet Bars.—There is no activity in the steel market in the way of sales. The Carnegie Steel Co. has several of its steel mills down tight, and others are operating at 50 per cent of capacity, or less. Steel plants in the Wheeling and Youngstown districts are also down, and the loss of production will be keenly felt for some time. The strike situation here and at Youngstown is slowly getting better, but even under the most favorable developments it will be a week or more before idle steel mills can get in coal, pig iron and other supplies and get going again.

We now quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $60; 2 x 2-in. billets, $42; Bessemer sheet bars, $42 to $70; open-hearth sheet bars, $42 to $80, and forging billets, ordinary carbons, $80 to $85 base, all f.o.b. Youngstown or Pittsburgh mill.

Ferroalloys.—The acute shortage in supply of ferromanganese of the last several months has been intensified by the railroad strike. Some steel plants are in distress for ferromanganese, and unless they soon get a supply, will be compelled to shut down, even should the railroad strike be settled. It is said several cars of domestic ferromanganese have been sold at $300 per ton, the buyer assuming the risk of delay in delivery. Prices on all grades of ferroalloys are very strong and likely to be higher.

We quote 76 to 80 per cent domestic ferromanganese $200 for last half delivery and $250 for prompt delivery, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $85 to $90, and 18 to 22 per cent spiegeleisen at $55 to $57.50, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $45.75 to $46.25; 7 per cent, $50 to $50.50; 8 per cent, $52 to $52.50; 9 per cent, $54 to $54.50, and 10 per cent, $56.50 to $57. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Local fabricators report operations badly upset by the railroad strike. Practically no deliveries of plain steel have been made by the railroads for about a week, and while local fabricating shops are operating, output is not more than 50 per cent of normal. The McClintic-Marshall Co. has taken 7000 tons for steel buildings for a new sugar refinery for the American Sugar Refining Co. at Baltimore, and about 1500 tons for plant extensions for the Atlas Crucible Steel Co., Dunkirk, N. Y. Two local fabricators are low bidders on 15,000 tons of steel for the Cincinnati Southern Railroad bridge at Cincinnati, which is to be awarded on Friday, April 23, and one of these two concerns will probably get the job. The Carnegie Steel Co. price on plain material remains at 2.45c. up to 15 in., but other mills are quoting from 2.90c. to 3.50c. at mill.

Plates.—There has been a further curtailment in production of plates by the railroad strike and output to-day is not more than 50 per cent of normal.

We quote sheared plates of tank quality, ¼ in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three to four months, range from 3.50c. to 4c. at mill.

Sheets.—The railroad strike has cut down the output of sheets by the American Sheet & Tin Plate Co. and the independent mills to 50 per cent or less of normal. Some sheet mill plants are entirely closed, while a few are working part time using up what steel was on hand when the strike started. The American Sheet & Tin Plate Co. is adhering rigidly to the March 21, last year, prices on all grades of sheets, but independent mills are quoting prices anywhere from $20 to $40 a ton higher, the prices depending entirely on whether the buyer is a regular customer and the delivery wanted. It is claimed 200 tons of automobile sheets was sold recently at 17½c. per pound, or $350 per ton at mill.

We quote No. 28 gage box annealed, one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interest, while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—While it is likely a good part of the tonnage of the independent tin plate mills for last half delivery will be sold at the price of the leading interest, which is $7 per base box, yet some sales have been made at higher prices. One reported sale was 50,000 boxes for last half at $8.50 per base box at mill, and two smaller sales are reported for the same delivery, and at about the same price. The railroad strike has caused a big loss in production of tin plate, only one or two of the independent mills being able to operate in full since the strike started. This means that a still larger quantity of tin plate, scheduled for second quarter delivery, will go over into third quarter or later. Operating conditions among some independent tin plate mills are a little better, and an estimate made on Tuesday was that production was running close to 50 per cent of normal.

We now quote tin plate to domestic consumers for remainder of the year delivery at $7 per base box, stock items $8.50 to $9, and for export $11 to $12 per base box, all f.o.b. Pittsburgh.

Wire Rods.—No new business is being done in wire rods in this market, local makers saying they have none to spare, and with their reduced output on account of the railroad strike it will be some time before they have any rods for the open market. We continue to quote soft Bessemer and open-hearth rods at $70 to $75 and high carbon rods from $80 to $100 at mill, prices depending entirely on the carbon content.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co., and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Wire Products.—Local makers say they are absolutely refusing to take on any more orders for wire nails or wire, and will not do so until the strike situation has cleared up. Independent makers are quoting wire nails at $4 and $4.50 base per keg on the new card issued some time ago. The American Steel & Wire Co. price remains at $3.25 base per keg, for wire nails, and $3 per 100 lb. for bright basic wire. Prices on wire products as quoted by the leading interest and the independent mills are given on page 1203.

Cold-Rolled Steel Bars.—No attempt is being made by local makers to do business until the railroad strike is settled, and in addition they are filled up for three or four months and are quoting only at intervals and to regular customers. The automobile trade continues to take close to 75 per cent of the total output. We quote cold-rolled steel bars at $4.10 to $4.25 per 100 lb., to regular customers, f.o.b. at mill. Premium prices range from 5c. to 6c. per pound for small lots. Two leading local makers state they are absolutely refusing to take any premium business, conserving their entire output for their regular customers.

Iron and Steel Bars.—Output of mills rolling iron or steel bars is down to 50 per cent or less on account of the railroad strike. Practically no shipments have been made for over a week, and it will be another week or more before anything like normal conditions prevail again with the railroads. Mills are sold up for some months on both iron and steel bars and specifications were coming in very freely when the railroad strike started and shut off all shipments.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 4c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c., and refined iron bars, 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Hot-Rolled Strip Steel.—Two local makers state they are adhering rigidly to 5½c. and 7c. per lb. on hot-rolled strips to regular customers and are refusing absolutely to accept any premium business. Local makers are not selling for second half delivery and output is greatly reduced on account of the railroad strike. The Superior Steel Corporation has opened a temporary warehouses in this city in an effort to better supply its trade, using motor truck delivery in some cases.

Cold-Rolled Strip Steel.—Several local makers are quoting 8½c. on cold-rolled strips to regular customers and state they are not selling above or below that figure and are refusing all premium business. It is said some small lots of cold-rolled strips have sold at as high as 12c. per lb. for fairly prompt delivery.

Spikes.—No large inquiries have come out lately and the railroads are having their own troubles now and are not interested in the spike market. It is said a number of leading railroads have not yet covered their needs on spikes for this year, and they are expected to come in the market after the railroad strike is out of the way. Local spike makers say they are sold up for three months or longer.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅝ in. and 7/16 in., $4.50; 5/16 in., $5; boat and barge spikes, $4.25, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Boiler Tubes.—The demand for stationary tubes is very heavy. For locomotive tubes it is not so active, but is expected to be larger in the near future, as some large orders for locomotives have been lately placed for which the tubes have not yet been bought. Discounts on iron and steel tubes are given on page 1203.

Cotton Ties.—The season will open shortly and prices of cotton ties by the independent makers are likely to be higher than last year. The Carnegie Steel Co. price last season on cotton ties was $1.70 per bundle and the independent makers sold at the same figure. The price for this season is likely to be announced very shortly.

Hoops and Bands.—The Carnegie Steel Co. price on hoops and bands remains at 3.05c., but one local maker is now quoting 5.50c. for such delivery as it can make likely not before third quarter.

Iron and Steel Pipe.—Output of tubular goods has suffered greatly by reason of the railroad strike, particularly in the Youngstown, Ohio, district, where two large pipe mills are reported down tight. Mills are sold up on all the tubular goods they can make for this year, and usually refuse to quote on any new inquiry. Any orders booked are from regular customers only, and for shipment at convenience of the mill. Discounts on iron and steel pipe are given on page 1203.

Old Material.—The local scrap market is dead, due almost entirely to the railroad strike. Dealers expect the railroads to resume taking scrap by the end of this week, but consumers are showing very little interest in the market, and have pretty heavy stocks on hand. There has not been a real buying movement in scraps since last January, but some dealers believe that early in May, if railroad conditions are normal again, several leading consumers will come in the market for round lots of scrap, as their stocks are expected to be pretty well worked off by that time. Dealers still feel there is too wide a range between prices of steel melting scrap and steel making pig iron, but just now there is nothing in sight to indicate that this gap will be narrowed in the near future, either by an advance in prices of scrap, or a decline in prices of pig iron. Many steel plants are either shut down entirely, or else are running to only 25 or 50 per cent of capacity, and this means a very large loss in consumption of scrap. Dealers are not trying to make sales, and say it is useless to do so until the railroad situation is cleared up and shipments resumed. Under these conditions, prices quoted are purely nominal, as there have not been enough sales in this market for several weeks on which to fix actual prices. We therefore quote nominal prices as follows:

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$25.00 to $25.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	32.00 to 33.00
Compressed steel	22.00 to 22.50
Bundles sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	16.00 to 16.50
Bundled sheet stamping	15.00 to 15.50
No. 1 busheling	17.50 to 18.00
Railroad grate bars	26.00 to 26.50
Low phos. melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	30.00 to 30.50
Railroad malleable	30.00 to 30.50
Iron car axles	37.00 to 38.00
Locomotive axles, steel	34.00 to 35.00
Steel car axles	31.00 to 32.00
Cast iron wheels	40.00 to 41.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	16.50 to 17.00
Sheet bar crop ends (at origin)	28.00 to 28.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 32.50
Cast iron borings	19.00 to 19.50
No. 1 railroad wrought	31.00 to 32.00

The Koppel Industrial Car & Equipment Co., Koppel, Pa., is building 20 new houses, and plans to build 100 more for the use of its employees at Koppel.

Chicago

CHICAGO, April 20.

There has been little diminution in the severity of the railroad strike and consequently production is not much heavier than a week ago. Small numbers of switchmen return to work every day, but the total number who have gone back is not yet large. With the switching crews available, the railroads are concentrating on the movement of live stock, perishables and coal. Transportation of pig iron and finished iron and steel products is at a standstill. In the meantime, the Government is taking drastic action against the leaders of the outlaw union, but as yet this has had no effect on the situation in local yards. Yesterday John Grunau, president of the Chicago Yardmen's Association, and generally credited with initiating the strike, was incarcerated in Joliet by Government officials and since then other leaders have been seized. The Illinois Steel Co. continues to operate but five blast furnaces each at Gary and South Chicago. The Inland Steel Co., Indiana Harbor, banked one furnace last week and suspended operation in its No. 2 plant. Arrivals of coal Saturday point to a full resumption of work within a day or two. The Wisconsin Steel Co., South Chicago, had two idle stacks part of last week, but has since refired one of them. The Steel & Tube Co. of America has so far avoided a shut down of any of its plants, with the exception of one merchant blast furnace which was banked for a short period last week and has since resumed. The Interstate Iron & Steel Co. is again operating its plants in a limited way and the same is true of the Calumet Steel Co. The plant of the Republic Iron & Steel Co. at East Chicago has operated without interruption since the beginning of the strike, having had considerable fuel on hand at that time.

Pig Iron.—The market, while not active, shows improvement over a week ago. A Wisconsin melter has bought 1500 tons of foundry for last half shipment, 1000 of which brought $42, Birmingham. A Michigan foundry closed for 1000 tons of Southern foundry for second half delivery at the same price. An inquiry for 600 tons of foundry is current. With these exceptions activity is confined largely to sales of spot iron to melters outside Chicago. In Peoria a seller booked an aggregate of 400 tons for early shipment. The leading Northern producer is operating all its blast furnaces, although for a brief period last week one Federal furnace was inactive. While all stacks are going, production is not up to normal. A continuation of the railroad strike will, of course, make the banking of furnaces imperative, but this does not now seem probable. Quotations by Southern furnaces vary considerably. Two important interests are selling foundry at $42, base, Birmingham, a third is asking $43 and two smaller makers are taking tonnage at $40. On the other hand, a Virginia furnace is asking $44 and an Ohio furnace $45.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average sil. 1.50 (other grades subject to usual differentials), deliv. at Chicago...	$57.50
Northern coke, No. 1 sil. 2.25 to 2.75.	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25.....	43.00
Northern high phos. foundry.....	43.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25.....$48.20 to	50.20
Southern coke, No. 2 foundry, sil. 2.25 to 2.75..... 46.70 to	48.70
Southern foundry, sil. 1.75 to 2.25.. 45.00 to	47.00
Malleable, not over 2.25 sil.....	43.50
Basic	42.00
Low phos. (copper free).....	52.00
Silvery, 7 per cent.....	59.30

Ferroalloys.—Spiegeleisen has been active of late, approximately 2500 tons having been bought here at $60, furnace. This commodity is waxing in strength, late sales having brought as high as $65, furnace. Ferromanganese is quiet in this market but a sale of 210 tons for last half delivery was closed in St. Louis at $200 delivered.

We quote 76 to 80 per cent ferromanganese, last half, $200; spot, $235 to $250; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $60 furnace.

Coke.—The demand for foundry coke is strong and buying is in full swing. Quotations range from $12.50 to $12.75 for spot shipment and from $10 to $13, Connellsville for second half delivery. Most contracts include a wage clause which authorizes price changes in the event of wage advances. A current inquiry calls for 6000 tons of run of oven coke.

Railroad Rolling Stock.—The Union Pacific has ordered 1000 steel gondola cars from the Pullman Co. and a like number from the Ralston Steel Car Co. The Northern Pacific has purchased 300 Rogers ballast cars from the American Car & Foundry Co. The Chicago & Northwestern is inquiring for 500 ore cars. The Southern Pacific will construct 2000 box, 1000 flat, 1000 stock and 65 caboose cars in its own shops.

Plates.—In view of the continued severity of the railroad strike the present contraction in buying is not surprising. Some observers, however, are not sure that the previous rate of market activity will be resumed when the transportation troubles are over. Consumption of steel, they state, is as heavy as ever, or would be barring present railroad difficulties and buyers are pressing hard for deliveries on contracts, but the volume of inquiry shows signs of falling off. This tendency has been noticeable in plates and structural material for a number of weeks. Attention is also called to the fact that a number of independents are now taking business for fairly early delivery at recessions below the peak prices which obtained earlier in the year. Among these is an Eastern mill, which is offering ¼-in. plates and heavier at 3¾c., Pittsburgh, for delivery within 30 days after the termination of the rail strike. In this connection it should be noted that in plates and shapes the leading interest is still able to take further commitments for shipment this year. Railroad car orders continue to account for the placing of additional steel. The Union Pacific has bought 1000 steel gondola cars from the Pullman Co. and a like number from the Ralston Steel Car Co. About 10,000 tons of plates and shapes and 700 tons of axles for the cars ordered from the Pullman Co. will be furnished by the leading interest. The Illinois Steel Co. will also supply 3400 tons of plates and shapes for 300 ballast cars let by the Northern Pacific to the American Car & Foundry Co. The Southern Pacific is inquiring for 2300 tons of axles.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Structural Material.—The demand for structural shapes has fallen off and this is accounted for by a gradual decline in the number of new building projects. While much new work is under contemplation, many of the larger jobs have failed to materialize. At the same time, some fabricators are again seeking business and are offering concessions under the high prices recently prevalent. The American Bridge Co. will fabricate 1230 tons for an assembly plant, warehouse and paint shop to be constructed by the Oliver Chilled Plow Co., South Bend, Ind. The Omaha Structural Steel Co. has been awarded 1200 tons for foundry buildings for the Griffith Wheel Co. at Council Bluffs, Iowa. Plans have been completed for the first unit of the ore concentration plant of the Mesaba Iron Co., Babbit, Minn. This structure will involve about 600 tons and will have a capacity of about 2200 tons of ore per day. Fifteen or twenty additional units are contemplated. Recent lettings include:

Struss Bascule Bridge, Kenosha, Wis., 725 tons to Fort Pitt Bridge Works.

Ore bridge, Cambria Steel Co., Johnstown, Pa., 510 tons to McClintic-Marshall Co.

United Verde Copper Co., blacksmith shop, calcine trestle and boiler house, 400 tons, to an independent shop.

Jacob Dold Packing Co., tank house and fertilizer building, Buffalo, 242 tons, to Union Foundry Co., Chicago.

Shiewe Coal & Dock Co., Detroit, coal pockets, 200 tons, to Wisconsin Bridge & Iron Co.

State Highway Commission of Idaho, three truss spans, Boise, 150 tons, to American Bridge Co.

Miami Copper Co., Globe, Ariz., plant additions, 150 tons, to Kansas City Structural Steel Co.

City of Chicago, girders for Roosevelt Road viaduct, 119 tons, to American Bridge Co.

Illinois Central Railroad, bridge repairs, Elmhurst, Ill., 117 tons, to American Bridge Co.

Dells Paper & Pulp Co., shop building, Eau Claire, Wis., 113 tons, to American Bridge Co.

State Highway Commission of Idaho, two truss spans, Caldwell, Idaho, 100 tons, to American Bridge Co.

The Vollrath Co., power plant addition, Sheboygan, Wis., 100 tons to Northwestern Bridge & Iron Co.

Falls Mfg. Co., Oconto Falls, Wis., wet machine room for paper mill, 100 tons, to Northwestern Bridge & Iron Co.

Pending prospects include:

American State Bank, Omaha, 2000 tons, bids not yet asked.

Standard Oil Co., four-story unit of office and warehouse Building, Milwaukee, 1100 tons, bids taken.

Roosevelt Theater, Ascher Brothers, Chicago, 600 tons, bids asked.

Bridge over Missouri, Bismarck, N. D., tonnage not given.

McCormick Theater, Randolph and Dearborn streets, Chicago, 100 tons.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—Although the demand has been affected by the railroad strike, this is true to a less extent of bars than of other steel products. Implement manufacturers are exceptionally busy and are pressing the mills hard for their requirements. The exodus of labor from the country to the cities has accentuated the importance of the machine in farm work. Neither the foremost interest nor the leading independent is accepting new orders for mild steel bars, although the latter expects to allocate a limited tonnage within the next week or two. An Eastern mill has sold bar size angles at 3.75c., Pittsburgh. Bar iron and rail carbon steel bars remain firm at the prices quoted below.

Mill prices are: Mild steel bars, 2.35c. to 4.50c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c., Chicago; rail carbon, 3.75c., mill. Jobbers quote 3.87c. for steel bars out of warehouse.

Sheets.—On undelivered first half business taken on the basis of prices fixed at time of delivery, the leading independent is invoicing blue annealed at 5.02c., black at 6.02c. and galvanized at 7.52c; f.o.b. Chicago. It has not yet announced prices to rule on second half tonnage. An Eastern mill will soon open its books for third quarter and will probably ask 6.75c., Pittsburgh, for one pass black, and 8c. for galvanized. The American Can Co. is employing its fleet of motor trucks to haul sheets to its Chicago plant from the mills of the American Sheet & Tin Plate Co. at Gary.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.75c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock No. 10 blue annealed, 6.52c.; No. 28 black, 7.50c.; No. 28 galvanized, 9c.

Wire Products.—To prevent curtailment of operation, the leading interest is utilizing motor trucks to transport billets and acid between its Illinois plants. The railroad situation shows little improvement and shipments are correspondingly small. While the roads are open in spots, numerous embargoes make it difficult to take advantage of them. Embargoes at St. Louis and Kansas City, for example, shut off shipments through those gateways to western and southwestern destinations. Wire products are very strong. Independents have been offered from $80 to $85 for soft wire rods. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1203.

Rails and Track Supplies.—Unless operation shows unexpected improvement during the remainder of the year, the leading interest's commitments in standard sections will not be entirely disposed of in 1920. It is booked nearly as far ahead in track fastenings, but is still taking on limited tonnages. In light rails it is doing business somewhat more freely, in a few cases taking attractive export orders in addition to domestic commitments.

Standard Bessemer rails, $45 to $55; open hearth rails, $47 to $57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills. Standard railroad spikes, 3.55c. to 4c. Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. f.o.b. makers' mills.

Cast Iron Pipe.—While the market is still devoid of advertised inquiries, prices have advanced $4 a ton. There continues to be a moderate amount of business from private sources.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $79.80; 6-in. and above, $76.80; class A and gas pipe, $2 extra.

Bolts and Nuts.—There is no change in the bolt and nut situation. Independent jobbers have advanced structural and boiler rivets. For mill prices, see finished iron and steel f.o.b. Pittsburgh, page 1203.

Jobbers quote structural rivets, 5.62c.; boiler rivets, 5.72c.; machine bolts up to ⅞ x 4 in., 30 per cent off; larger sizes, 20 off; carriage bolts up to ⅞ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras are unchanged.

Old Material.—Inability to ship and lack of interest on the part of consumers have brought the market to a standstill. In the absence of transactions, the prices quoted below are nominal. While users are not buying, neither are dealers attempting to sell, the latter feeling that the consumption of scrap during the railroad strike will mean a substantial demand when transportation is fully resumed.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$33.00 to	$34.00
Relaying rails	40.00 to	50.00
Car wheels	37.00 to	38.00
Steel rails, rerolling	32.00 to	33.00
Steel rails, less than 3 ft	28.50 to	29.00
Heavy melting steel	23.50 to	24.00
Frogs, switches and guards, cut apart	23.50 to	24.00
Shoveling steel	23.00 to	23.50
Low phos. heavy melting steel	28.00 to	28.50
Drop forge flashings	18.50 to	19.50
	Per Net Ton	
Iron angles and splice bars	$30.50 to	$31.50
Steel angle bars	24.00 to	24.50
Iron arch bars and transoms	31.50 to	32.50
Iron car axles	39.00 to	40.00
Steel car axles	32.50 to	33.50
No. busheling	20.00 to	21.00
No. 2 busheling	14.50 to	15.00
Cut forge	24.00 to	24.50
Pipes and flues	17.50 to	18.00
No. 1 railroad wrought	27.00 to	27.50
No. 2 railroad wrought	24.00 to	24.50
Steel knuckles and couplers	23.50 to	24.00
Coil springs	25.00 to	25.50
No. 1 cast	37.00 to	37.50
Boiler punchings	24.00 to	24.50
Locomotive tires, smooth	24.00 to	24.50
Machine shop turnings	12.00 to	12.50
Cast borings	14.00 to	14.50
Stove plate	30.00 to	30.50
Grate bars	29.50 to	30.00
Brake shoes	25.50 to	26.00
Railroad malleable	27.00 to	28.00
Agricultural malleable	26.50 to	27.00
Country mixed	17.50 to	18.50

Buffalo

BUFFALO, April 20.

Pig Iron.—Less than 4000 tons of pig iron was sold in this market during the past week. Of this about 2,500 tons approximately was foundry which sold at a base price of $45 for 1.72 to 2.25 silicon; $46.25 for 2x, 2.25 to 2.75 silicon and $48 for No. 1, 2.75 to 3.25 silicon. This iron was for delivery over the last half. Another lot of 1,500 tons of basic was sold at $44. Of the foundry, one furnace took 900 tons, another 1,000 tons and another 500 tons. Although some resale iron, notably one lot of 150 tons of 2x iron was sold by a foundry here for $44, it is generally conceded that the market is $45 base now and is steadily growing firmer at this price owing to conditions developed by the switchmen's strike. Furnaces have already lost 10 days and will lose another two weeks, it is estimated, before getting into their stride again, all of which tends to make the market a strong one. It is conservatively estimated that of the 23 furnaces in this district, at least six have been forced to bank, and of the remainder at least 12 are on reduced blast, so that their output is small. It is recognized that it will mean a loss of close to a month's production in the blast furnaces of the district before they recover from the effects of the setback, even though the strike is over the first of the week.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil	$48.00
No. 2 X foundry, 2.25 to 2.75 sil	46.25
No. 2 plain, 1.75 to 2.25 sil	45.00
Basic	44.00
Malleable	46.25
Lake Superior charcoal	$58.00 to 60.00

Finished Iron and Steel.—The market has been badly knocked out by the strike of the railroad switchmen. Practically all rolling mills in the district with one exception found it necessary to shut down at heavy

loss. The plants of the Lackawanna Steel Co. and the Donner Steel Co. were still down Saturday, and it was stated at the Wickwire Steel Co. that fuel supplies were steadily diminishing and that a few more days would see this plant idle. There is very little moving either in new inquiry or commitment. Mills are holding all inquiry in check, such as appears, and replying to inquirers that the business cannot be handled until some definite settlement is reached in the railroad strike. The labor trouble in this instance has crippled the plants worse than during the steel strike of last September. Inquiry in this district has been very much restricted though that from Canada continues just as large. No shipments whatever have been made during the week just past so that consumers will feel the pinch of the strike more this week than last. Business in structural steel is very light and though fabricating shops of all kinds are still in operation, nothing is coming in or out. This has further complicated the situation for the concrete bar manufacturers who have been complaining of the small supplies of bars that have been coming in to them. The leading interest is being flooded with requests to obtain a place on its books, but it is holding commitment down to old customers and is steadily adhering to its March, 1919, schedule in prices.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—The market is in utter stagnation on account of the strike of the switchmen. No cars are moving in or out and it is certain that when the break has occurred, there will be no scrap moved until such time as other freight is out of the way. Dealers are inclined to believe that the enforced inactivity may mean a buying movement of more or less good-sized proportions after the strike, as consumers will take precautions not to be handicapped in case of another emergency. Of course there is little shortage of scrap material in plants now affected by the strike, but as a general policy it is thought more attention will be paid to accumulation of supplies. All prices quoted now are nominal, as the little trading going on now among dealers is negligible.

We quote dealers' asking prices, per gross ton f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$25.00 to $26.00
Low phos., 0.04 and under	32.00 to 33.00
No. 1 railroad wrought	31.00 to 32.00
No. 1 machinery cast	38.00 to 39.00
Iron axles	40.00
Steel axles	41.00 to 42.00
Car wheels	37.00 to 38.00
Railroad malleable	31.00 to 32.00
Machine-shop turnings	16.50 to 17.00
Heavy axle turnings	20.00 to 21.00
Clean cast borings	17.00 to 18.00
Iron rail	30.00 to 31.00
Locomotive grate bars	24.00 to 25.00
Stove plate	32.00 to 33.00
Wrought pipe	21.00 to 22.00
No. 1 busheling	20.00 to 21.00
Bundled sheet stamping	17.00 to 18.00

Birmingham

BIRMINGHAM, ALA., April 20.

Pig Iron.—The United States Steel Corporation's Alabama auxiliary, following the Corporation's general policy of stabilization, continues to sell Birmingham foundry iron for last half delivery at $38 per ton, silicon 1.75 to 2.25, and the three leading foundry iron producers of the Birmingham district continue to sell at $42 per ton on the same analysis base. One Southern consumer is known to have bought a sizeable tonnage at $38 and a like amount at $42. Consumers in the same city have paid these two prices and intervening ones. All smaller furnaces get $40 to $42 for what little they have to offer. There have been a number of firm offers for spot iron for export at $42, but they have been turned down either on account of prior booked capacity or on account of inability to furnish the required analyses. The Alabama company has blown in a relined Gadsden stack and now has two in blast. The Gulf States Steel Co. has put out its furnace for a short term of repair, but is extremely busy in its wire drawing department. The additions to that department, about doubling capacity, will be completed about July 1. The company has conducted a selling survey of South America by personal representative and business has doubtless been obtained, although no official notice to that effect has been issued. The Tennessee company may blow in two more stacks at Bessemer, and in that event its level of $38 for last half iron might become more influential in the open market. It is probable that its by-product coke plant will enable it to obtain enough coke to blow in these stacks.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil. 1.75 to 2.25	$40.00 to $42.00
Basic	39.00 to 41.00
Charcoal	55.00

Cast-Iron Pipe.—Cast-iron pipe has advanced $4 per ton. Effective April 16, the base is $73 for 4-in. sizes and $70 for 6-in. and upward. Plants have all they can do in small sizes, but could take on more large size business. The Anniston shop of the United States company has installed equipment for turning out flange pipe for oil wells and is executing orders. Sanitary shops could not well be busier.

Coal and Coke.—Brookwood coke has settled at $11 and Majestic at $12. Very little is leaving the district, but there is a demand for the output locally. The Sloss-Sheffield company, which began operation of its 120-oven Semet-Solvay works during the week, has shut down the 500 city, the 350 Bloosburg and the 150 Coalburg beehive ovens. The city plant, built in 1882, will be dismantled, the others kept for emergency. The new works will furnish 1800 to 2000 tons of coke per diem. The Alabama coal output has increased to 324,000 tons weekly, the largest in some time.

Old Material.—The scrap market is still dull as to steel shapes and active in cast scrap. Steel consumers maintain an obstinate attitude against demands for higher prices and so far are impregnable.

We quote per gross ton, f.o.b. Birmingham district yards prices to consumers, as follows:

Steel rails	$21.00 to $21.50
No. 1 heavy steel	20.00 to 20.50
Cast-iron borings	11.00 to 11.50
Machine-shop turnings	11.00 to 11.50
Stove plate	24.00 to 24.50
No. 1 cast	31.00 to 32.00
Car wheels	30.00 to 31.00
Tramcar wheels	28.00 to 29.00
Steel axles	29.00 to 30.00
No. 1 wrought	21.00 to 21.50

Boston

BOSTON, April 20.

Pig Iron.—The market has not recovered from the outlaw railroad strike. It will be a week or more before movement of railroad freight is anything like normal. Pig iron sales the past week have been considerably less than 5000 tons. Almost no No. 2 plain was sold. Leading Alabama furnaces are accepting business only from regular customers and have accepted small tonnages of silicon 2.25 to 2.75 and 2.75 to 3.25, third and fourth quarter delivery, at $42 furnace base. Higher silicon has sold in a small way on a higher base, but under special conditions. Leading Virginia furnaces are still out of the market, but No. 2 X and No. 1 X, third and fourth quarter, have sold on a $43 to $44 furnace base and it is reported $42 has been done in some cases. Buffalo prices take a wide range, fourth quarter, silicon 2.25 to 2.75 resale iron has sold at $42 furnace base. Other resale at $44 and slightly lower and still more at $45, the last in car lots only. Most furnaces will not sell for less than $45 base. Last half eastern Pennsylvania has sold in a small way at $44 to $46 furnace base. Charcoal, last half, sold at $55 furnace base.

East. Penn., sil., 2.25 to 2.75	$48.15 to $50.15
East. Penn., sil., 1.75 to 2.25	46.90 to 48.90
Buffalo, sil., 2.25 to 2.75	47.15 to 50.15
Buffalo, sil., 1.75 to 2.25	45.90 to 48.90
Virginia, sil., 2.25 to 2.75	47.95 to 49.95
Virginia, sil., 1.75 to 2.25	46.70 to 48.70
*Alabama, sil., 2.25 to 2.75	49.95
*Alabama, sil., 1.75 to 2.25	47.75

*Alongside Boston prices.

Finished Iron and Steel.—During the past few days, mill representatives have withdrawn quotations and offerings, and shipments of finished iron and steel into New England virtually ceased, the result of the outlaw railroad strike. The market, therefore, is nominal. Stocks of iron and steel on hand at some manufacturing plants in this section of the country are close to the exhaustion point, but if enforced shut-downs are experienced, it will be due more to the lack of fuel. McClintic-Marshall Co., Pittsburgh, is awarded 360 tons for a Boston garage and approximately 100 tons for a Winship, Boit Co., Wakefield, Mass., plant. Stone & Webster, Boston, ask bids on 250 tons for Manhattan Rubber Co., Morristown, N. J., reclaiming mill, on 225 tons for its boiler house at Passaic, N. J., and shortly will be open for bids on 375 tons for other buildings for the same company.

Tool Steel.—The market is firmer because of increased costs of mill production and distribution. Ordinary tool steel is quoted at 17c. and 18c. per lb., mostly the latter price, as compared with 16c. a month ago, and extra steel at 19c. to 20c., as against 19c. Otherwise prices are about the same. The demand for steel is satisfactory, but stocks are badly broken.

Jobbers quote: Ordinary tool steel, 17c. to 18c. per lb. base; extra, 19c. to 20c. base; double special, 66c. base; nonchangeable, 36c. base; high speed steel, $1.25 to $1.40 base. Mill shipments are quoted at 1c. per lb. less.

Warehouse Business.—Warehouse iron and steel prices have advanced another 50c. per 100 lb., making a total of $1.50 since Jan. 1 last. Steel in transit from the mills is sold before it arrives and at prices ruling date of shipment from Boston. Consumption of iron is greater because of the scarcity of steel. Stove bolts are 10 per cent higher at 50 per cent discount from list. All kinds of nuts are list plus 3c. per lb., an advance of 2c. since Jan. 1, last. Cut nails have been advanced 25c. per keg by the Reading Iron Co., Reading, Pa. Structural rivets are higher at $6.85 in some instances and at $6.70 in others. Extras are now on a 25c. per 100 lb. base, instead of 10c. as heretofore.

Jobbers quote: Soft steel bars, $5.50 base per 100 lb.; flats, $6.00 to $6.35; concrete bars, $5.50 to $6.00; tire steel, $6.50 to $7.00; spring steel, open hearth, $10; crucible, $15; steel bands, $7.25; steel hoops, $8.25; toe calk steel, $7.25; cold rolled steel, $7.00 to $7.50; structural, $5.50; plates, $6.00; No. 10 blue annealed sheets, $8.00; No. 28 black sheets, $8.55; No. 28 galvanized, $10; refined iron, $5.50 base; best refined, $7; Wayne, $8; band iron, $7.25; hoop iron, $8.25; Norway iron, $20.

Old Material.—The market is a purely local one because of transportation conditions. Foundries depending on New York cast are buying from nearby old material dealers, paying around $43 delivered for No. 1 machinery and about $41 for No. 2 cast. No sales of No. 1 and No. 2 mixed are reported. Stove plate offerings are freer, as is usual in spring, but they are readily absorbed at $33 to $34 delivered. Dealers are still buying pipe for Pennsylvania delivery at not better than $21.40 f.o.b. shipping point. An accumulation of borings and turnings has made for easier prices. Railroad malleable also is easier and the tendency of railroad and yard wrought prices is downward. Prices as quoted at local yards follow:

No. 1 heavy melting steel	$19.50 to $20.50
No. 1 railroad wrought	29.00 to 30.00
No. 1 yard wrought	24.50 to 25.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	21.00 to 21.50
Machine-shop turnings	15.00 to 16.00
Cast iron borings	17.00 to 18.00
Heavy axle turnings	16.50 to 17.00
Blast furnace borings and turnings	15.00 to 15.50
Forged scrap	16.00 to 16.50
Bundled skeleton	16.00 to 16.50
Street car axles	31.00 to 32.00
Car wheels	37.50 to 38.50
Machinery cast	39.00 to 40.00
No. 2 cast	36.00 to 37.00
Stove plate	30.00 to 31.00
Railroad malleable	27.00 to 28.00
Rerolling rails	29.00 to 30.00

The Long & Alstatter Co., Hamilton, Ohio, which manufactured agricultural implements for 60 years but suspended its activities in that direction during the war, recently purchased the large plant of the McNeal & Urban Safe Co. in that city, where it is now making a full line of cultivators, disk plows, disk harrows, etc.

New York

NEW YORK, April 20.

Pig Iron.—That the breaking of a strike is not immediately followed by satisfactory resumption of business has been clearly shown in Eastern territory during the past few days. Very little freight has been moving and many foundries have been on the verge of closing for lack of pig iron or coke. Owing probably to the many difficulties with which foundries have been contending, there has not been so much interest in buying, but prices have been well maintained. In eastern Pennsylvania, $45 furnace continues the lowest quotation on iron having 1.75 to 2.25 silicon. The lowest price reported on Buffalo iron was $45 for No. 2X and it is probably that the seller would sell the base iron at $44, not maintaining the full differential. Some Southern iron has been sold for export from Norfolk and other Southern ports including 1500 tons of foundry for Great Britain and smaller tonnages for Japan, Scandinavia and Italy. There is also an inquiry for 5000 tons additional for export. One firm reports sales of 6000 tons of various grades and tonnages including 800 tons for export. The coke situation continues very bad on account of the railroad strike.

We quote for delivery in New York as follows:

East. Pa., sil. 2.75 to 3.25	$49.05
East. Pa., sil. 2.25 to 2.75	48.05
East Pa., No. 2 plain, sil. 1.75 to 2.25	46.80
Buffalo, sil. 1.75 to 2.25	$47.90 to 48.90
No 2 X Virginia, sil. 2.25 to 2.75	47.65

Ferroalloys.—The ferromanganese market continues very strong but exceedingly quiet. Consumers show no tendency to bid up prices which continue at $200, delivered, for the American alloy for the last half with $225 to $250, delivered, obtainable for such small lots of early delivery alloy, either British or American, as are offered. There have been a few sales of small lots of both British and American alloy at $225, seaboard, and $250, delivered, respectively, both for early delivery. Several hundred tons of British alloy for shipment from August on has also been sold at $195, seaboard, and American producers have entered some contracts at $200, delivered, for the last half. According to British trade papers ferromanganese is scarce in that country and premiums are being paid for prompt alloy. The substitution of silico-manganese is suggested wherever possible and some of this alloy is reported sold at £42 per ton, delivered British ports. This is regarded as made by French producers. The spiegeleisen market is extremely strong, the minimum price being $75, furnace, at which level a few sales are noted. High grade manganese ore is quoted at $80 per ton, seaboard, for early delivery. It is interesting to note that according to British trade papers the price of Indian ore has advanced to about 4s. per unit which at the present rate of exchange is on a par with the price in this country. It is stated that supplies in India are limited and that Caucasian ore is almost unobtainable. The market for 50 per cent ferrosilicon is very strong with practically all American producers sold up to July 1. Inquiries are fairly good but prices are largely nominal at $85 to $90 per ton, delivered.

Finished Iron and Steel.—Although shipments from the mills have been practically stopped on account of the railroad strike, little uneasiness on the part of consumers has been evidenced and apparently there has been a sufficiently safe margin of raw material stocks to prevent shut-downs. In spite of the repeated expectation of noticeable weakness in plates because of the country's large capacity, the fact remains that considerable business is being done at the high levels, and so much is it a seller's market that buyers find it difficult to place orders for 1/4-in. and lighter plates. One mill, for example, will not entertain offerings in which 3/16-in. thickness material exceeds 10 or 15 per cent of the total weight of the order. England is conspicuous still as a seeker of ship plates. The Japanese financial setback does not appear to be of great concern in the steel trade, so large a part of the Japanese orders being against firm credit and of an irrevocable nature, but some suspension may result from the

delayed deliveries beyond the control of the steel makers. That prices are still no serious deterrent is indicated in the award to the McClintic-Marshall Co. of 16,000 tons of fabricated steel work for the American Sugar Refining Co. at Baltimore. As to prices, while sales of 9500 tons of export plates are noted at 4c., Pittsburgh, export, quotations on a round tonnage for Kobi, Japan, indicate a base quotation slightly under 3.75c., Pittsburgh; and 800 tons for domestic account of 1/4-in. plates all one size were sold at 3.85c., Pittsburgh. Structural and ship rivets are especially scarce; railroad spikes are being sold at $4.25 per 100 lb.; track bolts at $6 per 100 lb., and a rather general advance of about 10 per cent has been made in bolts with cut threads, small machine bolts with cut threads now carrying the same discount as the long bolts, or 30 and 10 per cent off list, and the smaller carriage bolts with cut threads also carrying the same discount as the longer bolts, or 30 per cent off list. A pipe line company which has upward of 10,000 tons of plates which it is apparently not now going to use is offering to sell at 3.25c., Philadelphia or Jersey City, and doubtless other Atlantic ports. Structural lettings in addition to the one mentioned include 700 tons for a Jewish communal center, Eastern Parkway, Brooklyn, to the Hinkle Iron Co. and the following to the American Bridge Co.: 300 tons for the Baltimore & Ohio, 250 tons for a cotton mill, New Bedford, Mass., and 350 tons for a storage warehouse, West 107th Street, New York. The Interborough Co., New York, is in the market for 800 tons for another inspection shed.

We now quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.77c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the higher prices for the second quarter; bar iron, flats, wider than 6 in., 4.57c.; ⅜ and 7/16 in., round and square, 5.27c.; light rounds, squares and flats, 5.77c., and other sizes, 4.27c.

High Speed Steel.—The market has been quiet because of the railroad strike, only a few small shipments having been made by some companies by parcel post. Prices continue firm at $1.25 per lb. to $1.30 per lb., New York.

Warehouse Business.—The situation remains unchanged. Shipments to points outside the city have been prevented by the railroad strike and low stocks have curtailed local business. Prices remain the same, but a larger number of sales of sheets are now being made at the highest price we quote. Although open hearth spring steel is selling from stock at 7c. per lb., New York, with some sales at 6.50c. per lb., the mill quotations of 6c. per lb. will probably cause an increase by warehouses before long. There is a similar condition in tire and toe calk steel. The strike in brass and copper has not caused an embarrassing situation yet and warehouses have hopes of deliveries coming through soon. We quote prices on page 1218.

Cast-Iron Pipe.—An advance of $4 per ton became effective April 20, meaning a $14 advance since Jan. 1. Manufacturers claim that preceding raises have not curbed orders and they do not expect that the recent marking-up will have this effect, though such a result would not be serious as makers have their books filled for three or four months in advance. Makers in this district state that they now have their price levels equivalent to those prevailing in the South. Railroad embargoes permitted one manufacturer to keep his plant open but four days last week, and probably four this week will be the limit. We now quote 6-in. and heavier at $76.30, New York; 4-in. $79.30, with $2 additional for Class A and gas pipe.

Old Material.—One consumer of heavy melting steel in eastern Pennsylvania has dropped its price to $22; another to $24, though $1 above these prices prevailed about three weeks ago. This has caused a drop in the local market for this commodity. Demand for steel car axles for export has boosted this grade about $2. Relaying rails recently were bought for $56 in the New York market. On several other items, prices have receded. Because of embargoes, little scrap has been shipped and consumers are evidently waiting for better shipping conditions before inquiring.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$19.50 to $20.50
Rerolling rails	31.00 to 32.00
Relaying rails, nominal	52.00 to 54.00
Steel car axles	36.00 to 37.00
Iron car axles	43.50 to 44.00
No. 1 railroad wrought	33.00 to 33.50
Wrought iron track	22.00 to 22.50
Forge fire	16.00 to 16.50
No. 1 yard wrought, long	25.00 to 25.50
Light iron	9.00 to 10.00
Cast borings (clean)	18.00 to 18.50
Machine-shop turnings	16.00 to 16.50
Mixed borings and turnings	15.00 to 15.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	21.50 to 22.00
Stove plate	28.50 to 29.00
Locomotive grate bars	27.50 to 28.00
Malleable cast (railroad)	28.50 to 29.00
Old car wheels	38.00 to 38.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$39.00 to $40.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	38.00 to 39.00
No. 1 heavy cast, not cupola size	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	32.00 to 33.00

St. Louis

ST. LOUIS, April 20

Pig Iron.—Despite the transportation troubles due to the railroad strikes, the consumers of pig iron have been doing considerable buying for forward delivery, being of the opinion that the strike could not last long and that the actual need for finished products was such as to justify maintenance of supplies of raw materials. Fortunately most of the foundries have been well supplied as to yards and have been able to keep on working despite the strikes. One furnace in the south announced an advance to $44 Birmingham basis during the week on the ground that its sales ahead were such as to justify the increase. None of the others followed suit, although it is stated that some few sales were made at the new figure. Very few sales have been reported of Tennessee Coal, Iron and Railroad pig at $38, except for some tonnage taken at Belleville by the stove plants. Most of the southern furnaces are maintaining their prices at $42 Birmingham basis and are selling for all deliveries in tonnages ranging down from 500 tons to carloads. No. 2 Northern is quoted at from $45 to $48.25 Ironton basis, the former being for foundry grade and the latter for malleables.

Coke.—All coke ovens represented in this territory withdrew from the market during the week, chiefly because of the rail strike and the inability to get cars for shipments. The last sales made were at $12 Connellsville for second quarter delivery, with New River at $13 per ton for last half. No business is doing in by-product coke, near-by supplies being sold up.

Finished Iron and Steel.—In finished products the railroad strike has had its effect on consumers, but because of the sold ahead condition of the mills, there has been nothing notable in the market as relates to future business. Structural material is on a 1921 delivery basis with steel corporation subsidiaries and plates from its mills are not deliverable on new business before the fourth quarter. No changes in prices have been made. The warehouses have been seriously handicapped by the strike as although they were making some progress prior thereto they are now unable even to keep up their activities because of the failure of supplies to come in.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 6.59c.; No. 28 black sheets, cold rolled, one pass, 7.60c.; No. 28 galvanized sheets, black sheet gage, 9.10c.

Old Material.—The scrap market is completely stagnant because of the strike's continuance preventing the movement in or out of yards. Mill and foundry operators are being controlled by condition of fuel supply, yard room for storing finished products and

the status of orders ahead. Both Helmbacher rolling mills are shut down for lack of fuel. The National Enameling & Stamping Co.'s mill, because of congestion in the yards, and others are slacking up as various causes become more acute. Dealers are doing nothing in scrap and lack of transactions prevents changes in quotations, all material being nominally held at last figures. The only railroad list out is 400 tons for the Cotton Belt closing next Monday. Dealers are looking for a softer market even though the strike is broken because of the large supplies of scrap that are expected to come on the market with resumption of traffic movement.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$32.50 to $33.00
Old steel rails, rerolling	31.50 to 32.00
Old steel rails, less than 3 ft	26.00 to 26.50
Relaying rails, standard sections, subject to inspection	50.00 to 55.00
Old car wheels	34.50 to 35.00
No. 1 railroad heavy melting steel	22.50 to 23.00
Heavy shoveling steel	21.50 to 22.00
Ordinary shoveling steel	21.00 to 21.50
Frogs, switches and guards, cut apart	24.00 to 24.50
Ordinary bundled sheets	14.50 to 15.00
Per Net Ton	
Heavy axle and tire turnings	16.00 to 16.50
Iron angle bars	29.50 to 30.00
Steel angle bars	22.00 to 22.50
Iron car axles	39.50 to 40.00
Steel car axles	33.50 to 34.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.50 to 26.00
No. 2 railroad wrought	23.50 to 24.00
Railroad springs	22.50 to 23.00
Steel couplers and knuckles	24.00 to 24.50
Locomotive tires, 42 in. and over, smooth inside	22.50 to 23.00
No. 1 dealers' forge	22.00 to 22.50
Cast iron borings	14.00 to 14.50
No. 1 busheling	21.50 to 22.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	35.00 to 35.50
Stove plate and light cast	30.50 to 31.00
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.50 to 26.00
Pipes and flues	17.00 to 17.50
Heavy railroad sheet and tank	16.50 to 17.00
Railroad grate bars	27.50 to 28.00
Machine-shop turnings	13.50 to 14.00
Country mixed	19.00 to 19.50
Uncut railroad mixed	19.50 to 20.00
Horseshoes	24.50 to 25.00

Philadelphia

PHILADELPHIA, April 20.

Following the collapse of the railroad workers' strike, traffic conditions show an approach toward normal, but it will be the end of the week, no doubt, before all of the roads are accepting shipments to all points. Some of the Eastern steel plants were hard hit as a result of the strike, while others, self-contained as to coal and coke, got through in better shape. Many blast furnaces, however, were banked last week, but the blast will be put on as soon as sufficient coke is received.

The railroad strike came just at a time when the Eastern steel plants were hitting a rate of production that has not been equaled since the war period. A Central Pennsylvania plate mill, having more finishing capacity than steel-making capacity, bought slabs from another steel maker and with this additional material had reached a plate production considerably in excess of anything ever done before. Another plate company had 17 open-hearth furnaces in operation the week before the strike and was about to light others. The shortage of gas coal, resulting from the railroad embargoes, forced the putting out of all but four of the furnaces. At the beginning of this week, six were lighted and more will be in operation as soon as further supplies of coal are received. The Bethlehem, Midvale and Cambria plants had some difficulties, but on the whole got off much better than the smaller independents. Buffalo mills and furnaces were harder hit than those of the eastern Pennsylvania district.

The past week was exceedingly quiet in all branches of the industry. Consequently there are few new developments. Pig iron is quiet but firm.

Pig Iron.—With many furnaces banked on account of insufficient coke and forced to pile iron, because of inability to ship, the Eastern pig iron trade has gone through a difficult week, but conditions at the beginning of this week showed some improvement. Some furnaces made shipments late last week and to-day (Tuesday) there was a better car supply at several points. Business has been quiet, but there has been a little selling for forward delivery. A Virginia furnace, for example, took 2500 tons of foundry iron last week in scattered lots, none more than 500 tons. Basic iron is quiet, with quotations by Eastern furnaces at $43 and $44, furnace. Gray forge iron has been bought, it is reported, by a large Eastern consumer at prices approximating those quoted for basic iron. A sale of 500 tons of standard low phosphorus iron at $50, furnace, is reported. An Eastern maker of malleable has advanced his price to $46.50, furnace, with $1 freight rate to Philadelphia. The same furnaceman also asks $1 higher for foundry iron, namely, $46 base, for delivery in second half. Virginia furnaces had no difficulty in operating last week, being self-contained as to coke, but could not ship any iron. The leading Virginia furnace interest and some of the smaller makers are now quoting $44 base, furnace, as a minimum on foundry iron. Another Virginia furnace quotes $43.25, furnace, on No. 2 plain, but has withdrawn from the market on No. 2 X. Although the foundry iron market shows every semblance of firmness, a large Eastern consumer reports having purchased several tonnages, including some of standard analysis, at several dollars a ton below the prices generally regarded as representing the market. A significant development is the falling off in demand for prompt iron, many Eastern foundries having more iron on hand than they can melt, this being partly due to the shortage of molders.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil.	$47.05 to $47.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	45.80 to 46.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	47.35 to 48.10
Virginia No. 2 X, 2.25 to 2.75 sil.	49.35
Basic deliv. eastern Pa.	44.80
Gray forge	43.00 to 44.00
Standard low phos. (f.o.b. furnace)	50.00
Malleable	46.75
Copper bearing low phos. (f.o.b. furnace)	47.00

Ferroalloys.—Furnaces making ferromanganese are behind on shipments, but there will be greater production soon. The Lavino Furnace Co. expects to have all of its four furnaces on ferromanganese within the near future, one now making pig iron. For second half $200, delivered, is apparently the minimum, though there are reports of shading. Spot alloy commands $250, though $230 can be done for May or June shipment. Few sales of spiegeleisen are being made in this market.

Coke.—The coke situation is precarious, the railroad strike and freight embargoes having caused a great scarcity. In the past few days, several brokers have been unsuccessful in getting coke to supply their customers. Foundries are in greater need of coke than pig iron. Some of the blast furnaces in the East have contracted for coke for the remainder of the year at $9, but others are reported to have paid $10. In the present emergency, as high as $11 has been quoted for prompt furnace coke, subject to the ability of the railroads to make shipments, while $12 appears to be the general level for foundry coke.

Semi-Finished Steel.—With sales at a minimum, the current quotations for billets are $60 to $65, Pittsburgh, for rerolling billets of open-hearth steel and $75 to $80 for forging billets. It is reported here that an automobile company has again paid upwards of $90 for sheet bars in the Pittsburgh district.

Plates.—Eastern plate mills were hard hit by the railroad strike, production in this district having been cut down fully one-half or more. Several plate mills were idle nearly all week. Effects of the strike will probably not be overcome for a week or two. Inquiry for plates during the past week was not large, but customers having contracts have specified rather heavily for second quarter. There has been some inquiry also for third and fourth quarter, but most of the mills are not quoting that far ahead. Car and locomotive plate inquiries are quite numerous, but aside from the Baltimore & Ohio and the Pennsylvania re-

quirements, mentioned in previous reports, the tonnages inquired for are small. Shipyards are buying quite a few repair plates. For ship plates, firebox, flanged and boiler steel and other specification plates the market is still strong at 4c., Pittsburgh, but certain mills which roll narrow plates—generally 72-in. or less—have sold ordinary tank quality at 3.75c. and 3.85c., Pittsburgh, with fairly early deliveries promised. A Pacific Coast shipyard is in the market for 12,000 tons, but the business will probably be placed in the Chicago district. England is in the market for ship steel. A sale of 2000 tons is reported at 4c., Pittsburgh, and a like tonnage is under negotiation.

Structural Steel.—So far as steel for building work is concerned, the market is very quiet. There are few inquiries and some mills have little to sell at present. The present lack of demand, it is predicted, will bring about somewhat easier conditions in the near future providing production gets back speedily to the rate attained before the railroad strike. Quotations are still being made by Eastern mills at 3.75c. and 4c., Pittsburgh.

Steel Bars.—There are no new developments in the bar situation, and apparently there is no relief of the bar scarcity in sight. Recent sales by Eastern companies have been at 4c. and 4.75c., Pittsburgh.

Sheets.—The demand for blue annealed sheets continues strong. A local mill continues to quote 5.25c. to 5.50c., base. Pittsburgh and Youngstown mills are offering little, if any, sheet tonnage in this district.

Bar Iron.—One large maker of bar iron has declined to quote several large buyers who ordinarily buy steel bars in preference to bar iron. Its policy is to reserve its output for regular bar iron users. An advance of $5 a ton is predicted by this manufacturer within the next two weeks.

Old Material.—The market is dull and featureless. It has been impossible to make shipments in the past week and consumers have stayed out of the market. Prices are without change. We quote for delivery at consuming points in this territory as follows:

No. 1 heavy melting steel	$24.00 to $24.50
Steel rails rerolling	32.00 to 33.00
No. 1 low phos., heavy 0.04 and under	30.00 to 31.00
Car wheels	40.00 to 41.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 yard wrought	29.00 to 30.00
No. 1 forge fire	19.50 to 20.00
Bundled skeleton	19.50 to 20.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	18.50 to 19.50
Turnings (short shoveling grade for blast furnace use)	18.00 to 19.00
Mixed borings and turnings (for blast furnace use)	17.50 to 18.00
Machine-shop turnings (for rolling mill and steel works use)	19.00 to 19.50
Heavy axle turnings (or equivalent)	20.00 to 21.00
Cast borings (for rolling mills)	20.00 to 21.00
Cast borings (for chemical plant)	24.00 to 25.00
No. 1 cast	38.00 to 40.00
Railroad grate bars	30.00 to 31.00
Stove plate	29.00 to 30.00
Railroad malleable	30.00 to 31.00
Wrought iron and soft steel pipes and tubes (new specifications)	24.50 to 25.00
Iron car axles	45.00 to 46.00
Steel car axles	42.00 to 44.00

Cincinnati

CINCINNATI, April 20.

Pig Iron.—The market is quiet, due no doubt to the uncertainty of conditions generally caused by the railroad switchmen's strike. Most of the iron sold in this territory during the week has been from southern furnaces, one agency disposing of about 6000 tons, half of which went to melters in this district. Other agencies report sales in smaller volume. The Southern market is now firmly established at $42 Birmingham, for silicon 1.75 to 2.25, with several furnaces asking $44 for the base trade. A sale of 1000 tons of southern foundry iron is noted in this territory at the $42 figure, and another of 550 tons of silicon 3.75 to 4.25 at $43.25, Birmingham. A local agency sold 1000 tons of southern iron, silicon 3.75 to 4.25 to a St. Louis melter at $48, Birmingham, for delivery during the last half. A sale of 5000 tons of basic for May-June delivery to a central Ohio melter at $43, Lake furnace, is also noted. There is very little inquiry before the market, this consisting mostly of fill in tonnages from melters who had underestimated their requirements. Jackson County silvery is now being quoted by two furnaces at $58 to $59 for 8 per cent, but this iron is still to be had in limited tonnages at $55. Malleable iron, weakness in which was noted last week, has firmed up and now is being quoted at $44.50 to $46, furnace. Furnaces in the Ironton district are receiving fairly good supplies of fuel and none of them has been forced to bank. They have been forced to pile their make, as no cars are available in which to ship. The Miami furnace at Hamilton has been running on the ragged edge for several days owing to a shortage of coke, but conditions have so far improved that it will not be necessary to bank.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil.	56.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	46.80
Basic Northern	41.80
Malleable	$45.80 to 46.80

Coke.—The coke shortage continues, and with the partial railroad tie up, no immediate improvement is expected. However, local foundries have suffered less than those in other districts and have been able to keep running continuously. Coke prices have not materially changed during the week. Connellsville foundry is being offered to consumers at $12 with old contracts being renewed at $10. New River foundry is quoted at $13 and Wise County at $12. Some local agencies feel that these prices are altogether too high and are confident that they will soon be brought down to a more reasonable basis.

Finished Material.—While the railroad switchmen's strike has affected shipments from the mills operating in this territory, production was maintained at full capacity, and with the reserve supply of raw materials, taken in conjunction with the collapse of the strike and the consequent removal of embargoes, it is not expected that mills will have to curtail operations. The only thing that is worrying the officials is that there may not be enough cars when the embargoes on freight shipments are entirely removed to take away the finished material now being piled. The Newport Rolling Mill Co. and the American Rolling Mill Co. both are operating at 100 per cent of capacity, and are able to ship a considerable part of their output to points which have not been embargoed. The Whitaker-Glesner mills at Portsmouth are experiencing some difficulty in moving their output, as the strike situation in that city is reported as more serious than in other sections of southern Ohio. The demand for all kinds of finished products still is unsatisfied, and pressure is being brought to bear on selling agents of independent mills to accept specifications for the last half. As yet none of the sheet mills in southern Ohio has quoted for third quarter, and all are apparently satisfied to follow out their present policy of taking on tonnages which they feel reasonably certain of delivering in from 60 to 90 days. Warehouse business is very brisk, and until the switchmen's strike was declared, deliveries were improving greatly. Prices on all finished products remain the same as last week, and there appears to be less of a scramble among consumers to replenish their stocks at the high prices asked by brokers. Building operations in this city, which have been held up by a strike of carpenters, will be further retarded by the vote of the union men to remain off the jobs until their demands for $1.25 an hour are met. A lot of new construction work is also being held up. Bids for the Southern Railroad bridge over the Ohio River at Cincinnati will be received in Washington until May 1. This bridge will take a total of approximately 13,500 tons of steel.

Jobbers quote: Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.25c. base; No. 10 blue annealed, 7c.; No. 28 black sheets, 7.75c. to 8.75c.; No. 28 galvanized sheets, 9c. to 10c.

Old Material.—The scrap market is inactive, no trading being done. Dealers state that they are not taking in any material, and owing to the railroad sit-

nation, it is impossible to ship any out. Advantage is being taken of the lull in trading to sort out material in yards. In the absence of trading, prices quoted below are nominal, and are what would undoubtedly be paid by dealers were railroad conditions favorable to moving of supplies.

We quote as follows:

Per Gross Ton	
Bundled sheet	$16.00 to $17.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	50.00 to 51.00
Rerolling steel rails	30.00 to 31.00
Heavy melting steel	21.50 to 22.50
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00
Per Net Ton	
No. 1 railroad wrought	$26.00 to $27.00
Cast borings	13.50 to 14.00
Steel turnings	11.50 to 12.00
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tire (smooth inside)	23.50 to 24.50
Pipes and flues	17.00 to 17.50
Malleable cast	23.00 to 23.50
Railroad tank and sheet	16.00 to 16.50

Cleveland

CLEVELAND, April 20.

Conditions in the iron and steel industry are beginning to show a little improvement with the breaking of the strike, but the danger is not over, as additional blast furnaces will have to bank unless they secure coke within a few days. Coal reserves at some of the by-product plants have become dangerously low. Cleveland blast furnaces are still all operating except three American Steel & Wire Co. stacks and the Toledo, Detroit, Josephine, Scottdale, Genesee, Canton, Dover and Fonnie furnaces are still running, the latter being saved from banking by the receipt of a supply of coke to-day. The Cleveland Steel Co. shut down its plant this week and the Otis Steel Co. has closed down the plate mill at its Riverside works, its Lakeside works having been shut down for about 10 days. Most of the open-hearth furnaces of the United Alloy Steel Corporation at Canton are shut down. The Willys-Overland Co., at Toledo, has shut down the greater part of its plant, laying off 10,000 men because of lack of steel. Local mills were starting to move a little product to-day, but shipments are not yet being made to Cleveland from the Pittsburgh district.

Pig Iron.—A Valley consumer has purchased 7500 tons of basic pig iron for second quarter from a Valley furnace at price quotations at time of shipment. The furnace quoted $43.50, but the buyer declined to contract at that price. The market has been practically at a standstill for several days because of the strike, the only sales of foundry iron reported being a few small lots of 500 tons and under. Furnaces have devoted their attention to attempts to keep operating and most of the furnaces in this territory have been able to do this with their reserve stocks of coal for their by-product plants and with small surplus stocks of coke held by furnaces that use Connellsville coke. Although the strike appears to be over, several furnaces have about run to the end of their fuel supply and one or more merchant stocks may have to bank this week. Very little iron was shipped by rail last week from furnaces in this territory, but shipments are now being made in fair volume by some of the furnaces. Practically no iron was moved out of Cleveland during the strike, but some was hauled in trucks by local furnaces. Some Detroit iron was taken in trucks for local consumers, but nearly all Detroit foundries as well as those in Pontiac were shut down because of the cutting off of their power. The product of the Perry furnace at Erie was taken by local consumers. Dover furnace was able to ship its product to Massillon. Outside shipments from Toledo were shut off. Eastern foundries were apparently the most affected by the cutting off of their supply of pig iron, as many urgent requests for shipment were received from the East. All shipments of Southern iron were shut off. It is believed that during the strike the loss in production of pig iron was greater than the loss in consumption, and consequently that the market will be tighter in respect to deliveries because of the strike.

We quote, delivered Cleveland, as follows, based on 40c. switching charge for local iron, a $1.40 freight rate from Valley points and $5 from Birmingham:

Basic	$43.40
Northern No. 2 foundry, sil. 1.75 to 2.25	43.40
Southern foundry, sil. 2.25 to 2.75	$46.25 to 49.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	58.40 to 61.40
Standard low phos., Valley furnace	48.00 to 50.00

Coke.—The foundry coke market is fairly active. No prompt shipment coke is being offered, but many consumers are covering with contracts for the last half or the full year. Some Connellsville producers who have been taking contracts for foundry coke at $10 have withdrawn from the market, expecting higher prices, but others are still taking contracts at $11 to $12. Some Virginia coke is being sold in this territory at $12 for last half or full year. As foundries have not been able to secure shipments for several days, many are suffering from a shortage of coke.

Iron Ore.—Ore shipments from docks are starting to pick up following the break in the railroad strike, but it is expected that because of embargoes at various points, it will be several days before ore is moving forward to the furnaces at the rate it was being shipped before the strike. The only Lake Erie dock at which the men have not returned to work to-day (Tuesday) was the Pennsylvania dock at Ashtabula, and the men at that dock are expected to return shortly. At the other docks, either the men are back or ready to work. At several docks ore is being loaded and held on cars until it can be shipped to its destination. The C. & P. dock in Cleveland resumed operations Monday. The Erie dock at Randall was not shut down during the week, but could ship ore to only a few points. The New York Central dock at Ashtabula started up to-day. The Pennsylvania dock at Erie is operating but shipments can only be made to some points. At Fairport the men have reported for work, but shipments have not started because there is no place as yet to which the ore can be shipped. The B. & O. dock at Lorain resumed Monday. The National Tube Co. dock at Lorain is operating in a limited way, being interfered with by embargoes. The Wheeling & Lake Erie docks at Huron resumed to-day. Both docks at Toledo have resumed operations but are as yet able to ship only a little ore because of an embargo at Columbus. Buffalo docks are working in a limited way. The effect of the strike on dock shipments is indicated by the fact that from April 10 to 15 only 85,000 tons of ore was loaded as compared with 195,800 during the same period last year. From April 1 to 15 622,350 tons was loaded at docks as compared with 542,650 tons during the same period last year. Ice is still rather heavy at the Soo and other upper Lake channels, but it is expected the conditions will improve so that a start in ore shipments can be made about April 25. Some of the ore boats at the lower Lake ports will be delayed in starting up the Lakes because of their inability to secure fuel coal, shipments of which were practically shut off by the strike.

We quote, delivered, lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Bolts, Nuts and Rivets.—Some of the local bolt manufacturers were forced to shut their plants down part of last week because they were unable to ship out their product, and further shut-downs are expected this week. Because of the scarcity of wire, several additional manufacturers have advanced their prices about 10 per cent on small machine and carriage bolts and are quoting small machine bolts with rolled threads at 40 and 5, cut thread at 30 and 10, carriage bolts, rolled threads, at 30 and 10, cut thread 30. However, some makers are still adhering to the old prices. Specifications are fairly heavy. There is little demand for rivets in round lots, but specifications are holding up well. A leading local manufacturer is threatened with a shut-down this week because of lack of steel and has been unable to make shipments during the past week except by truck.

Finished Iron and Steel.—The strike has caused a decided lull in the steel market. Several mills that had been taking orders withdrew from the market until the strike situation cleared up and inquiries have been unusually light. Mills which have continued to operate have piled up large stocks. About the only life in the market is inquiry from the Detroit automobile manufacturers, who are asking for contracts for round lots of sheets for the last half or for protection that will assure them a supply during that period. Some of the implement manufacturers are also trying to get under cover for the last half, but mills are declining to quote prices. The demand for light plates continues heavy. Manufacturers are buying light plates in place of blue annealed sheets because of the scarcity of the latter, the demand for which, particularly in the lighter gages, is still very heavy. The demand for tank plates is not active. However, a Cleveland mill has taken 6500 tons for shipment to Japan, and has an inquiry for 7500 tons for export. Ruling quotations for early delivery are 4c. for plates, 6c. for blue annealed sheets, and 7.50c. for black sheets. A Pittsburgh district mill has advanced its price on bands from 4.75c. to 5.25c. for early shipment. The structural situation is quiet. The Alliance Structural Co. has taken 800 tons for a zinc plant, the Fort Pitt Bridge Works has taken 150 tons for an addition to the Interstate Foundry Co. plant, Cleveland, and there is an inquiry for 900 tons for a highway bridge at Messena, N. Y. Warehouse stocks have been greatly reduced during the strike. In addition to local demand, considerable material has been shipped by trucks from warehouses to outside points.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates 3.57c. to 5c.; and structural material 3.70c. to 5.10c.

Old Material.—The scrap market is almost at a standstill as a result of the railroad strike. Practically no material was shipped last week and trading was confined to small lot transactions between dealers. There were hardly enough sales to form a price basis, but the market is weak. Consumers look for a further price decline and do not want to buy and dealers say that the present margin between what they must pay and what they get from consumers is not sufficient to warrant them doing any business. We note purchases in small lots by dealers of heavy melting steel at $23 and machine shop turnings at $14. Blast furnace turnings have sold at $17 and a Canton mill purchased a small lot of axle turnings at $20. Busheling has further declined and is very weak. Grate bars have sold at $26. Cast scrap is scarce and continues very firm.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$23.50 to $24.00
Steel rails under 3 ft	25.00 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	17.00 to 17.25
Iron and steel turnings and drillings	13.75 to 14.25
Short turnings for blast furnaces	16.25 to 16.75
Compressed steel	20.00 to 20.50
Railroad wrought	28.00 to 29.00
Railroad malleable	31.00 to 32.00
Steel axle turnings	19.50 to 20.00
Light bundle sheet scrap	15.00 to 15.50
Drop forge flashings over 10-in	17.00 to 17.50
No. 1 cast	42.00 to 43.00
No. 1 busheling	18.50 to 18.75
Railroad grate bars	25.75 to 26.00
Stove plate	29.00 to 30.00

The Boston Chapter, American Steel Treaters' Society, at its meeting, April 13, held at the Engineers' Club, had G. E. Mansfield, Wheelock Lovejoy Co., Boston, as the chief speaker, his topic being "Surface Carburizing."

The American Metallic Corporation, manufacturing collapsible corrugated boxes and shipping cases, will establish a plant in New Castle, Pa.

The Bucyrus Copper Kettle Works Co., Bucyrus, Ohio, has contracted for a steel building, 60 x 240 ft., to be furnished and erected by the Truscon Steel Co., Youngstown, Ohio.

British Prices Still Upward

Pig Iron Advances Imminent — Spanish Ore Higher — Resale Tin Plate from Argentina

(*By Cable*)

LONDON, ENGLAND, April 20.

The pig iron market is unchanged but an advance is imminent. The stringency in hematite iron continues with makers heavily booked and not quoting for forward delivery.

Steel prices are tending upward and the transportation situation is still acute. Few makers are willing to quote. The tin plate market is quiet and easier with June delivery quoted at 75s. to 76s., basis, and third quarter delivery at 72s., basis f. o. t. Shipments of resale tin plates from Argentina have arrived and also small parcels of American plate. Demand for terne plates is good with 65s. paid for heavy gages and makers booked to September. The galvanized sheet market is unsteady and prices are unchanged. Black sheets to Indian specifications are quoted at £48 f. o. b. with Japanese specifications at £70 for August-September delivery.

Although freight rates are easier, Spanish iron ore prices are rising.

The coal miners have accepted the terms offered. Coke supplies for blast furnaces are not yet relieved by the embargo on exports.

A large shipbuilding combination has been formed called the Shipbuilding & Associated Industries, Ltd. The nominal capital is £20,000,000, largely identified with Swan-Hunter interests.

We quote per gross ton, except when otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.96 for £1, as follows:

	£	s.		£	s.		
Ship plates	25	0	to 30	0		$99.00 to	$118.80
Boiler plates	28	10	to 33	0		112.86 to	130.68
Tees	25	10	to 32	0		100.98 to	126.72
Channels	24	15	to 31	5		98.01 to	124.74
Beams	24	10	to 30	0		97.02 to	118.80
Round bars, ¾ to 3 in.	27	0	to 32	10		106.92 to	128.70
Rails, 60 lb. and up	21	0	to 22	0		83.16 to	87.12
Billets	24	10	to 25	10		97.02 to	100.98
Sheet and tin plate bars, Welsh	31	0	to 35	0		122.76 to	138.60
Galvanized sheet, 24 g.	56	0	to 60	0		221.76 to	237.60
Tin plate, base box	3	13	to 3	16		14.47 to	15.05
Steel hoops	34	15	to 35	0		137.61 to	138.60
Cleveland basic iron	10	10				41.58	
West Coast hematite	13	15				54.45	
Cleveland No. 3 foundry (export to allies)	10	5				40.59	
Ferromanganese	35	0	to 40	0		138.60 to	158.40
Coke	2	15½				11.00	

British Iron and Steel Output in March

(*By Cable*)

LONDON, ENGLAND, April 19.

The production of pig iron in Great Britain in March was 699,000 gross tons and that of steel was 740,000 tons. The pig iron output in January and February was 665,000 tons and 645,000 respectively with the monthly average for 1919 at 617,000 tons. The steel output was 754,000 tons in January and 798,000 tons in February with the 1919 average at 658,000 tons per month.

The Atlas Crucible Steel Co., Dunkirk, N. Y., is planning for the erection of a number of additions to its plant on Howard Street, to double, approximately, the present capacity. The buildings will include an annealing works, 70 x 200 ft.; addition to 10-in. mill, 88 x 235 ft.; addition to 16 and 28-in. mills, 80 x 235 ft.; metal melting shop, 68 x 120 ft.; addition to wire mill, 40 x 140 ft., and billet storage building, 158 x 170 ft. The new plant will give employment to a large increased working force and is estimated to cost in excess of $1,000,000. The company recently acquired city property adjoining its plant for this expansion.

French Steel Industry Limited by Fuel Shortage

Obstacles to Export Trade Continue to Be Serious—Little Prospect of Increase in the Supply of Fuel—American Coal at Very High Prices.

(Special Correspondence.)

PARIS, FRANCE, April 2.—The iron and steel situation in France has hardly changed in the last few weeks. Production is continually dominated by the same causes: Difficulty in procuring supplies of fuel as well as minerals, transport and labor troubles and high prices. For certain regions the supplies of coal and coke increased somewhat, notably in Meurthe and Moselle and in Lorraine. Still blast furnaces and foundries are not receiving what they need of coal and coke for regular operations. Most plants are working at a less rate than that of the later months of 1919. German coke is now distributed on the following basis: 48 per cent for Meurthe and Moselle and other departments, while 52 per cent is reserved for Lorraine. All branches of the industry are swamped with orders. Rolling mills now are accepting them on condition of long-time delivery.

French ministers are making every effort to help the troubled situation. After visits to London, Lloyd George's promise was given that Great Britain would do everything it could to furnish France the 18,000,000 tons of coal a year which it needs.

The production of French coal mines in 1919, not including Lorraine was only 19,966,000 tons, or 6,345,000 tons below that of 1918 and 8,958,000 tons less than that of 1917. Adding the production of the Lorraine mines, which was 2,375,690 tons, the total for 1919 is 22,341,000 tons. In 1919 France imported 18,600,724 tons of coal, representing only 2.3 per cent more than the imports of 1918. There are three causes of the reduced production of coal last year: the withdrawal in 1919 of war prisoner labor, the strike of miners in June and July, and finally the application of the eight-hour day. The production in old France for 1920 is estimated at 24,000,000 tons.

It is expected that due to lack of coke the blast furnaces in the second quarter of this year cannot produce a third as much iron as in the same period in 1913. Hence the output of steel will be greatly insufficient, while the needs are unlimited. Bars have reached the price of 130 francs per 100 kilos and are expected to go still higher. No. 3 Luxemburg pig iron for export has been advanced from 650 francs to 1000 francs per ton at French frontier.

Forges et Acieries de Nord et Lorraine is the name of a company which has just been formed with a capital of 80 million francs. Its object is mining and metallurgical operations in all countries, especially Alsace-Lorraine, the Sarre and the Rhine country. The headquarters will be 25 rue de Clichy, Paris. The first directors include Jules Bernard, president of the Board of the Usines de la Basse Loire, Paris; Julien Bessoneau, Angers and Paris; Jules Canard, engineer of Usines de l'Esperance, and Ernest Cuvelette, director general of the Lens mines, Paris.

Obstacles to Export Trade

The president of the Chamber of Commerce of Nancy, in answer to a letter of the Minister of Commerce on the necessity of developing exports, points out all the difficulties under which the metallurgical industry in France is operating. He says: "All the factories in the region south of the department of Meurthe and Moselle which suffered but slightly or not at all from the war are in a position to resume their pre-war production, but are hardly operating at normal capacity. They are limited to this reduced production by the insufficiency of coal and coke. Furthermore, the products, which are being manufactured solely for interior consumption although insistently demanded by buyers, cannot be shipped owing to a lack of authorization to transport. The situation is the same for the big plants in liberated Lorraine (Thionville basin). These plants produced before the war more than 2,000,000 tons of steel. At present they are scarcely manufacturing a third."

The logical consequence of the increase in the price of transportation and coal is the rise in the price of rolled steel, amounting to about 25 francs. Pig iron has gone up 75 francs per ton, No. 3 thus being marked 525 francs f.o.b. works. Following the increase in the price of coke and coking coal imported from England their sale price has been fixed as follows, beginning April 1:

Ruhr coke, 190 francs on cars, German frontier.

Coke of all kinds other than Ruhr, 210 francs on cars at mine.

Coking coal of all kinds, 150 francs.

Each month hereafter these prices are subject to revision.

La Societe Metallurgique des Terres Rouges at Esch-sur l'Alzette had to postpone temporarily the relighting of two blast furnaces, the late political developments in Germany causing the possibility of irregularity in the supply of coke. The division Adolphe-Emile is again ready to operate as soon as enough coke is on hand.

In response to a question of Deputy Engerand in the French Chamber demanding the figures for the shipments of Lorraine ore to the Rhenish Westphalian country and the figures for coal and coke imported from those districts by Lorraine during 1919, the Minister of Public Works replied that the shipments of ore amounted to 1,147,947 tons. For the same period the amount of coke imported was 1,382,845 tons; coal, 342,498 tons. These figures do not include the deliveries of coal and coke according to the protocol.

A Nancy bank says it understands that the mines formerly exploited by the Acieries du Rhin, of Duisburg-Meiderich will be worked again by the Societe des Mines de la Loire, which has organized a company with a capital of 8,000,000 francs in order to exploit iron mines in Lorraine. The mines which have been taken under control are operating fully and produce per year more than 600,000 tons of first grade ore.

L'Union des Industries Metallurgique and Minieres, de la Construction Mecanique, Electrique et Metallique has begun an exhaustive inquiry through a questionnaire among its members, on the operation of the eight-hour law.

Advancing Prices

Recent iron and steel prices are as follows:

Comptoir de Longwy.—Pig iron No. 3, 525 francs.

Comptoir Siderurgique de France.—Semi-finished products, f.o.b. works, 825 francs per ton; beams, 1045 francs; rails, 1175 francs.

Comptoir for sheets and large flats.—Base 136 francs per 100 kilos for large flats, 155 francs for average sheets; merchant iron, base, 130 francs.

Schneider & Co. have just announced a third increase in rolled products, which for ordinary steel bars is 25 francs per 100 kilos. This makes an advance of 40 francs per 100 kilos as compared with the price for December. It results from the application of the new freight tariffs, the tax of 75 francs on French coal and the increase of 50 francs in the price of coke. The company announces that another increase is possible.

Numerous rolling mills probably will be obliged to use American coal entirely, it is announced, the price being approximately 450 francs per ton. In this case the market for rolled products will reach 159 francs and even more during April, it is said.

No Pending Bill to Make Metric System Compulsory

Agitation Goes On and Literature Is Deluging Washington Committee—Activities of the Bureau of Standards

WASHINGTON, April 20.—For months Representative A. H. Vestal, chairman of the Committee on Coinage, Weights and Measures of the House of Representatives, has been trying to convince a legion of inquirers that the present Congress will not consider metric legislation. But his efforts have been in vain. Daily the mass of correspondence grows.

As a mere matter of volume it seems fairly equally divided between the proponents of the metric system and its opponents, but each letter writer and petitioner pleads vigorously for or against bills which have not even been introduced. No bill to establish the metric system in the United States is pending in either house of Congress. There is no present prospect of the introduction of such a bill, although that technicality is an easy one to overcome. If some one will take the pains to draft a bill and will merely mail it with a request for its introduction to some member of either house to whom he is known, the bill would probably be dropped in the "hopper" and get on the calendars of Congress as a measure "introduced by request." It would be referred to the appropriate committee, but would die there without action.

Two such measures were introduced in the Sixty-fifth Congress. One, by Representative Dillon of South Dakota, provided that the metric system should be made "the sole standard of weights and measures in the United States after July 1, 1925." The other, by Senator Shafroth, sought to make the metric system compulsory in Government departments after Jan. 1, 1920, and for the whole country after Jan. 1, 1922. But neither of these bills reached the dignity of a hearing, much less a committee report, and both died with the expiration of the Sixty-fifth Congress, March 3, 1919.

No Metric Bill Pending

The supporters of the metric system as well as its opponents seem to think that these bills are still pending before Congress. In no other way can the deluge of letters for and against "the pending bills" be accounted for. Some of the letters even refer to the so-called "Vestal bill," although Chairman Vestal has sought in vain to demonstrate that neither he nor anyone else has introduced such a measure, and that neither he nor his committee has taken any attitude toward such legislation.

"Even if the bill were introduced," said Chairman Vestal, "there is no possibility of its being considered at the present session of Congress. We have too many other things to do. As for myself, I have tried to read a portion of the volume of propaganda on this question, but I have not made up my mind concerning it."

Chiefly the growing file of letters and literature in Chairman Vestal's files come from two sources. The propaganda in favor of the metric system seems to be sponsored by the World Trade Club of San Francisco. This is backed up by a long list of letters and postal card petitions asking speedy and favorable consideration for metric system legislation.

Most of the opposition comes from the American Institute of Weights and Measures, at New York, similarly backed by individual letters as well as protests from organizations throughout the country. The institute has sent the committee a typewritten brief of details against the compulsory establishment of the metric system. It has asked the committee's permission to make public the text of the brief.

Documentary Ammunition Piling Up

The World Trade Club has been even more lavish in its documentary contributions and has sent to the committee and its members a large mass of typewritten matter. One of these items alone consisted of 200 pages of typewritten manuscript in the shape of copies of magazine articles. The typewriting bill for this alone, at Washington rates, would be $50. Besides this, there is an expensive file of telegrams, largely from Pacific Coast points, and all of them unnecessary, for even Mr. Burleson's Postoffice Department could have delivered the messages in question long before the committee acts. There is also an interesting letter in the committee's files from a Californian who wrote to the committee that he had been employed to "compile a bibliography for the World Trade Club, in connection with its fight for the metric system." Chairman Vestal obligingly sent him a series of documents and references which later figured in the club's appeal to the committee. The World Trade Club also found it necessary to write to the committee explaining that its inclusion of a number of firms as supporters of the metric system—who later turned out to be its opponents—was due to the fact that it had copied these names from a report of Dr. S. W. Stratton, chief of the Bureau of Standards. Much of the literature favorable to the metric system is based upon a report made by Dr. Stratton and printed by Congress four years ago. Dr. Stratton has been a vigorous supporter of the system and the bureau has been active in its behalf, thus arousing complaint from opponents who declared that a Government institution should not take sides in this controversy.

Another interesting feature of the conflicting letters before the committee is the fact that many of the opponents of the metric system charge that the campaign in its favor is "German propaganda." To this the supporters of the metric system have countered by declaring that "our present antiquated weights and measures, inherited from Germany, is a hindrance."

O. P. S.

Quarter Earnings of Lackawanna Co.

The Lackawanna Steel Co. lost $449,720 during the first quarter of 1920, contrasted to a net profit of $1,207,109 for the first quarter of the previous year. However, unfilled orders on April 1, 1920, totaled 492,519 gross tons, compared with 124,570 gross tons on the same date of the year before. Net earnings for the first quarter of this year, after deducting taxes, repairs and maintenance were $336,910 compared with $1,997,991 for the corresponding period of 1919; balance after interest was $62,231 for this year and $1,725,666 for last. Appropriations for depreciation brought this balance to a loss for the period.

Will Sell Machine Tools

WASHINGTON, April 20.—The Navy Department will sell by sealed proposals a considerable quantity of machine tools, consisting of various kinds of milling and boring machines, lathes, grinders, drill presses, planers, trimmers, saws and shapers. Bids will be opened at 10 a. m., May 24, by the disbursing officer, senior member Board of Sale, Navy Yard, Washington. The machines were manufactured by some of the leading firms of the country.

The Sani Products Co., a newly formed organization with sales rooms and general offices in the Sani Building, 209 West Randolph Street, Chicago, will market the entire catalogued products of the Marietta Mfg. Co., Indianapolis, and the Chicago Hardware Foundry Co., North Chicago, Ill. C. G. Marks, who has been associated with the Chicago Hardware Foundry Co. for the past 12 years, during the past four years as general manager and advertising manager, will be general manager and director of sales for the new organization.

EXPORT TRADE SPOTTY

British Shipyards Buying—Japan Inactive—Demand for Wire Rods from Scandinavia

With the exception of orders for material that consumers are forced to purchase for present needs, the export business is broadly practically at a standstill. The few inquiries that recently began to come from European buyers caused a few exporters to look for a small amount of business from this source despite the adverse exchange, but Europe seems to be contenting itself largely with merely inquiring. These inquiries continue for pig iron and some plates, but inability to obtain extensions of credit from the exporters here, who are handicapped by the tight money market, interferes with much of the possible business. One exporter, who recently arranged shipment of about 200 tons of wire rods to Sweden at a low freight rate, says that the demand for rods from Scandinavian markets is heavy, but he is unable even partially to fill the orders he has received.

Japan, evidently having overbought in an orgy of speculation, seems to have settled down to absorb the material that has been delivered or in process of shipment. Orders are still being received for small quantities of rails, wire and wire rods. One exporter recently purchased for shipment, 200 tons of galvanized wire and another large house has an order for 1500 tons of 30-lb. rails and a small amount of wire rods. Orders have been received by another concern for small quantities of Nos. 8 to 11 gage galvanized wire and inquiries for sheets and plates.

South American buyers, believing that prices have almost reached the peak, are only buying small quantities for immediate needs. As an example of this, an exporter recently received an inquiry for prices on a "quantity of tinplate." Quoting a price on 500 boxes that left a small margin of profit, the South American buyer returned an order for 50 boxes, which could only be filled at a loss. Speaking of conditions prevailing in export trade, one of the partners of a large export house said that difficulty in obtaining material, the conditions with which orders are hedged when placed with the mills, car shortage and the recent freight embargoes, coupled with the present money market and added risks, makes the export business less profitable than ever before.

Sales of two different lots of plates to British shipyards are noted, both at 4c., Pittsburgh, one of 7500 tons and another of 2000 tons. The purchaser of the latter lot is in the market for 19,000 tons more, but the mill concerned is desirous of including tank quality before making further commitments.

Different opinions are expressed as to the effect of the Japanese financial market difficulties. Apparently only a small percentage of the Japanese business has been done without irrevocable credits being established and no cancellation of business is expected unless it grows out of delayed deliveries on the part of the mills because of conditions beyond their control, such as the succession of strikes which has interfered with full mill operations. Opinions are expressed that export brokers will find quantities of tin plates on their hands, but this situation is not yet evident. It is claimed on one lot of steel plates, on which a quotation was made, the c.i.f. price indicated a mill price below 3.75c., Pittsburgh.

Government Rails Exported

Of the 80-lb. rails bought by J. K. Joice & Co. from the Government, about 60,000 gross tons were purchased jointly by the L. B. Foster Co., Pittsburgh and the Hyman-Michaels Co., Chicago, which resold them for export in five lots of 30,000, 20,000, 10,000, 6000 and 4000 gross tons. The last shipment of these rails will be made within 30 days, according to the L. B. Foster Co. The bid of J. K. Joice & Co. to the Government for the entire lot of rails was $40 per gross ton.

IRON AND INDUSTRIAL STOCKS

Values Have Moved Uncertainly With U. S. Steel Common an Exception

The uncertainty attending the disruption of general business, occasioned by the outlaw railroad strike, has been reflected in prices for iron and industrial securities. But the high cost of borrowing money for business purposes has been and is the real determining factor in market values of stocks. Government financing, trade balances, an uneven distribution of loanable funds first in the West and then in the East, as well as other developments have forced banks to borrow frequently from Federal Reserve institutions to meet withdrawals by manufacturing interests, which in many instances have found it cheaper to sell Liberty bonds than to borrow from banks or to renew outstanding paper.

In the face of such adverse influences, United States Steel common has held remarkably steady. Other steel company's shares have not held as well, possibly because of the showing made by the Lackawanna Steel Co. in the quarter ending March 31. Equipment stocks have moved about uncertainly, most of them showing net losses for the week, American Locomotive being an exception. Weakness of General Motors in the face of its 1919 report, coupled with enforced shutdowns of plants, have undermined automobile share values.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	40 - 43¾	Lake Sup. Corp.	18¼ - 18½
Allis-Chalm. pf..	81⅞ - 82	Midvale Steel...	44⅝ - 49
Am. Can com...	44⅛ - 48¾	Nat-Acme	37 - 37⅞
Am. Can pf.....	— - 96½	Nat. E. & S. com.	75¼ - 79½
Am. C. & F. com.	137 -144¾	Nat. E. & S. pf..	97 - 97½
Am. C. & F. pf.	112½-113	N. Y. Air Brake.	103½-109¼
Am. Loco. com..	106¾-108½	Nova Scotia Stl.	63¼ - 67
Am. Stl. F. com.	42⅝ - 46⅝	Pittsb. Steel pf..	— - 90½
Am. Stl. F. pf..	— - 91½	Press. Steel com.	103 -111
Bald. Loco. com.	129½-144⅞	Press. Steel pf..	101 -101½
Bald. Loco. pf..	100½-101	Ry. Stl. Spg. cm.	97½-104½
Beth. Steel com.	90½ - 95½	Replogle Steel...	60¾ - 71½
Beth. Stl., Cl. B.	91½ - 99¼	Republic com....	105 -115¾
Beth. Stl., 8% pf.	110 -112	Republic pf.....	98 - 99½
Case, J. I., pf...	95½ - 97¾	Sloss com.....	73 - 80½
Chi. Pneu. Tool.	92 -107	Sloss pf.....	— - 94
Colorado Fuel...	37¾ - 39	Superior Steel...	53½ - 59½
Cru. Steel com..	242 -267½	Transue-Will. ...	60 - 62
Cru. Steel pf....	97¼ - 97⅞	Un. Alloy Steel..	46½ - 49
General Elec....	152 -154½	U. S. Pipe com..	21 - 22¼
Gt. No. Ore Cer.	36½ - 39	U. S. Steel com.	101½-106½
Gulf States Stl..	66 - 70½	U. S. Steel pf...	109⅞-112½
Int. Har. com..	132⅛-139¼	Vanadium Steel..	81¾ - 95¾
Int. Har. pf....	— -111¾	Va. I. C. & Coke.	90 - 97½
Lackaw. Steel...	71 - 81⅞	Westingh. Elec..	50¼ - 52⅛

United Alloy Steel Corporation Earnings

The report of earnings for 1919 by the United Alloy Steel Corporation shows a balance carried to surplus of $83,838. Profits totaled $3,382,736, net profit $2,183,838. Sales in 1919 amounted to $25,752,081, compared with $40,055,864 in 1918, $34,228,880 in 1917 and $16,704,665 in 1916. In his report to stockholders, President Harry R. Jones says:

"In November, 1918, when the armistice was signed, we were operating our plant at 100 per cent capacity on Government work and our order books were filled for months ahead. During the second quarter of 1919 we were able to operate our plant at about 50 per cent capacity." He then comments on the diastrous effects of the steel and coal strikes. Continuing, "We were able, however, in the face of the handicaps outlined above to earn our dividends, our depreciation, our taxes and carry a small balance to the profit and loss account. At this writing 1920 promises to be a prosperous year, as we have entered the year with our order books filled for at least six months in advance.

An additional blast furnace of the Steelton, Pa., plant of the Bethlehem Steel Co. was blown in April 14. Four of the six furnaces of the Steelton plant are now in operation, according to an announcement of officials.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

April	Copper, New York: Lake	Copper, New York: Electrolytic	Tin: New York	Lead: New York	Lead: St. Louis	Zinc: New York	Zinc: St. Louis
14	19.50	19.25	63.00	9.25	9.00	8.75	8.40
15	19.50	19.25	62.50	8.85	8.50	8.75	8.40
16	19.50	19.25	62.00	8.85	8.50	8.75	8.40
17	19.25	19.00	....	8.85	8.50	8.70	8.35
19	19.25	19.00	62.75	8.85	8.50	8.60	8.25
20	19.25	19.00	62.25	8.85	8.50	8.50	8.15

NEW YORK, April 20.

The immediate effect of the railroad strikes has been the holding up of virtually all buying and all the markets are therefore inactive and prices in some cases are lower. The copper market is marking time but prices of the leading producers are firm. Very little business has been done in tin, due to the industrial situation here. Prices for lead have fallen but the lower levels are regarded as temporary. The zinc market continues in its lifeless condition and prices have further receded. The antimony market is quiet.

New York

Copper.—The tendency to slacken in the copper market, noted a week ago, has been intensified by the industrial situation caused by the railroad strikes and buying has almost ceased. This is true of all the metals. It is argued that there is nothing to be gained by buying anything that cannot be delivered or shipped. The quotations for electrolytic copper by leading producers range from 19c. to 19.25c. for early delivery, with a slight premium for June shipment. While there is very little eagerness to quote for third quarter, prices for this position are nominal at 19.50c., New York. The same situation exists in the secondary or outside market, noted a week ago, where a limited quantity of electrolytic copper is available at 18.50c. With so little business recorded prices are more or less nominal in both cases. Lake copper is quoted at 19.25c. for April-May shipment, at which level a fairly large consignment was sold last week. While domestic buying is stagnant, purchases for foreign account and representing several countries is a feature.

Tin.—Because of continued high prices in London and because of the strikes here consumers generally have abstained from the market and almost no business has been done for some days. Shipments of tin have been impossible from the port of New York and there has been no incentive to buy. Spot Straits to-day is quoted at 62.25c., New York, with the London market quoted at £349 10s. per ton, or about £3 higher than a week ago. Late last week April-May and May-June shipment from the East was sold at around 61c. As soon as the industrial situation is straightened out an improved demand is looked for. Arrivals thus far this month have been 1279 tons, with 3691 tons reported afloat.

Lead.—Late last week a large independent producer startled the market by offering lead down to 8.50c., St. Louis, and since then the market has not recovered, due to general industrial conditions. We quote the market at 8.50c., St. Louis, or 8.85c., New York, with demand very light. Because of the amount of lead held up in transit it is almost impossible to buy a carload in New York and small amounts are sold at a premium. The quotation of the leading interest continues unchanged at 9c., St. Louis, or 9.25c., New York. A return to higher levels is predicted in the near future.

Zinc.—There is very little change in the situation. Prime Western for early and second quarter delivery is quoted to-day as low as 8.15c., St. Louis, or 8.50c., New York, and it is said that the metal can be bought as low as 8c., St. Louis. Selling on this side by British traders, noted a week ago, continues and is one cause of the weakness of the market.

Antimony.—Wholesale lots of the better grades for early delivery are quoted at 11c., New York, duty paid. The market is inactive.

Aluminum.—The leading producer is asking 33c., New York, for wholesale lots for early delivery of the virgin metal, 98 to 99 per cent pure. It can also be purchased from outside sellers at around 31c., New York.

Old Metals.—The market is very dull and prices are unchanged. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.25
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	18.25
No. 1 yellow rod brass turnings	11.50
No. 1 red brass or composition turnings	16.00
Lead, heavy	8.00
Lead, tea	6.50
Zinc	6.00

Chicago

April 20.—There has been little buying because of the impossibility of moving shipments. Activity has been largely confined to purchases from local stocks, although a moderate amount of buying for future delivery has been done. Copper is unchanged as to price. Tin has advanced because of local scarcity. There has been a fair demand for lead and futures have been sold at concessions. Spelter has weakened in sympathy with the London market, where the appearance of continental sources of supply caused a decline. Antimony is colorless. There have been no changes in the old metals. We quote Lake copper 19.75c. for carloads, tin 66c. to 67c., lead 8.75c., spelter, 8.37½c., and antimony 12c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 7c.; zinc, 6c.; pewter, No. 1, 37.50c.; tinfoil, 40c., and block tin, 50c., all these being buying prices for less than carload lots.

St. Louis

April 19.—In the non-ferrous markets there has been little feature save the inability to get supplies due to the rail strike, but quotations have not shown any special features. In car lot quantities quotations are as follows: Lead, prompt shipment, 8.62½c.; early June, 8.50c.; spelter, 8.40c. to 8.45c. In less than car lots quotations are: Lead, 9.37½c.; spelter, 9.50c.; copper, 20.50c.; tin, 68c.; antimony, 13c. In the Joplin district ore prices have been fairly strong and without much change, although the extreme prices have not been paid so frequently on lead, zinc blende and calamine as before the rail strike. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9c.; light yellow brass, 10.50c.; light copper, 13c.; heavy red brass, 15c.; heavy copper and copper wire, 16c.; zinc, 5c.; lead, 6c.; tea lead, 3c.; tinfoil, 43c.; pewter, 35c.; aluminum, 24c.

Two New Sibley Drilling Machines

A sliding head drilling machine with positive geared feeds and 24 in. swing, manufactured by the Sibley Machine Co. South Bend, Ind., was described in THE IRON AGE issue of Dec. 18, 1919, page 1246. Two new sizes of this machine are now announced having a 26 in. and 28 in. swing, respectively. The 26 in. machine has a table diameter of 23 in. and weighs 1950 lb., and the 28 in. machine has a table diameter of 25 in. and weighs 2000 lb. The specifications, otherwise identical, are as follows:

Height, top of cone pulley	94 in.
Maximum distance spindle to base	52½ in.
Maximum distance spindle to table	35½ in.
Traverse of table on column	13 in.
Traverse of head on column	25 in.
Diameter of table	23 in.
Feed of spindle	10¼ in.
Morse taper hole in spindle	No. 4
Positive geared feeds in thousands per rev. of spindle	8, 12, 16, 24
Spindle speeds, r.p.m.	26 to 403
Floor space required	23 in. x 63 in.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective from Jan. 1, 1920, in carload lots, to points named, per 100-lb. are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is $1.25 per 100-lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is $1.25, minimum carload 50,000 lb., or $1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is $1 per 100-lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c., to St. Paul 49½c., to Denver 99c., to Omaha 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c, minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, $3.25 to $4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.50 base
Large boiler rivets.....$4.60 base
Small rivets .....50 per cent off list
Small machine bolts, rolled threads,
40, 10 and 5 per cent off list
Same sizes in cut threads.....40 and 5 per cent off list
Longer and larger sizes of machine bolts,
30 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter, rolled threads.40 and 5 per cent off list
Cut threads .....30 and 10 per cent off list
Longer and larger sizes.....30 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head.....40 per cent off list
Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜ in. x 4 in.:
Smaller and shorter.....35 per cent off list
Longer and larger sizes.....25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts.2c. off list
Tapped nuts .....$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger .....60 and 5 per cent off list
9/16-in. and smaller .....70 and 5 per cent off list
9/16-in. and smaller A. L. A. M. or S. A. E.:
70, 10 and 5 per cent off list
Stove bolts in packages.....70 and 10 per cent off list
Stove bolts in bulk.....70, 10 and 2½ per cent off list
Tire bolts .....55 and 10 per cent off list
Track bolts .....6c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $70; chain rods, $75 to $80; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ⅝-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+ 1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6	50	37½	1½	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1½	27½	13½
2½ to 4	48	36½	2	29½	16½
4½ to 6	47	35½	2½ to 4	31½	19½
7 to 8	43	29½	4½ to 6	30½	18½
9 to 12	38	24½	7 to 8	22½	10½
1¼	21½	6½	9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2¼ in.	+10
2¼ in.	24	2½ and 2¾ in.	+ 1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50 to 5.95
Nos. 9 and 10 (base)	3.55 to 6.00
Ns. 11 and 12	3.60 to 6.05
Nos. 13 and 14	3.65 to 6.10
Nos. 15 and 16	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 6.30
Nos. 22 to 24	4.20 to 6.35
Nos. 25 and 26	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base)	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

PERSONAL

E. H. Haslam, who recently resigned as vice-president of the Mackintosh-Hemphill Co., Pittsburgh, will be connected with the Steel & Tube Co. of America, Chicago, in an official capacity, effective May 1 and will sail for Europe Saturday, April 24, on a business trip.

F. W. Montgomery is president of F. W. Montgomery, Inc., contractor for sheet metal work, 44 Wareham Street, Boston, a new corporation, and N. K. Gallinger is treasurer.

C, Brace Kelley has resigned as district manager of the American Sintering Co. at Youngstown, Ohio, to become associated, in an executive capacity, with the American Ore Reclamation Co., New York. Employees of the Youngstown and Hubbard plants presented him with an engraved gold watch.

Maurice N. Landay has been appointed resident manager of the Hyman-Michaels Co., Chicago, in the Pittsburgh district, effective May 1. The Pittsburgh office will be moved on the same date from the 11th floor of the First National Bank Building to suite 1312-1313 of the same building. Mr. Landay has been engaged in the scrap iron business in the Pittsburgh and Youngstown districts for many years, having been Pittsburgh district manager of the Wilkoff Co. for about five years, resigning as a director and as Pittsburgh manager of that company on April 1 with the intention of engaging in business for himself, but later deciding to join the Hyman-Michaels Co. Associated with him in the management of the company's Pittsburgh interests will be his brother, Lewis W. Landay.

J. H. McElhinney has resigned as assistant chief engineer of the Youngstown Sheet & Tube Co., Youngstown, Ohio, and has accepted a position as chief engineer of the Columbia Steel Co., Elyria, Ohio.

Arthur Kirkland, formerly sales engineer with the Detroit Tool Co., is now manager of the Cleveland office, 548 Leader News Building, of Russell, Holbrook & Henderson, Inc., New York. This office has been established for the purpose of handling the sales of the Sanford Precision Centerless Cylindrical grinding machine.

George H. Annan has been elected chairman of the machine shop section, Providence Engineering Society, Providence, R. I.; Charles Miller, vice chairman; and S. W. Burlingame, secretary. Mr. Annan succeeds D. K. Williams.

J. G. Snaith has been appointed open hearth superintendent for N. & G. Taylor Co.'s steel and tin plate works at Cumberland, Md. He was formerly employed as foreman melter for the North works, and Duquesne works of the Carnegie Steel Co.

F. W. Herman, 316 House Building, Pittsburgh, has been appointed manager of the Pittsburgh district for the American Manganese Bronze Co., Holmesburg, Philadelphia.

Prof. Bruce Benedict, University of Illinois, presented a paper before the mechanical engineering section of the Western Society of Engineers and the Chicago section, American Society of Mechanical Engineers, on "Teaching Shop Executives," April 15. Professor Benedict is head of the shop instruction department of the University engineering school at Urbana, Ill.

Howard E. Tracy, in charge of grinding machine development, Baxter D. Whitney Co., Winchendon, Mass., has resigned to become chief of engineering department, O. S. Walker Co., Worcester, grinding machines and magnetic chucks.

E. T. Burnes, formerly with Alley & Page, pig iron and coke merchants, but more recently with the Matlack Coal & Iron Corporation, New York, has severed his connection with the latter organization and returned to Alley & Page, 16 Exchange Place, New York, as salesman.

F. H. Payne, president Greenfield Tap & Die Corporation, Greenfield, Mass., and Walter B. Lashar, president American Chain Co., Inc., Bridgeport, Conn., are among the New England directors of the First Federal Foreign Banking Association, which has been granted a charter to finance export trade, with headquarters in New York.

Cato Aall, general agent in Japan for the American Steel Export Co. and consul-general for Norway in Japan, is in New York on his way back from London to the Far East via San Francisco.

M. K. Epstein is now sales agent in the Philadelphia district for Tate-Jones & Co., Inc., furnace engineers, Pittsburgh. He was formerly sales agent for Gilbert & Barker Mfg. Co., Springfield, Mass.

C. A. Severin has been appointed manager of the Cleveland branch, Becker Milling Machine Co., at 408 Frankfort Street, Cleveland, handling its milling machines and milling cutters. Mr. Severin will be assisted by Charles Brandhill, who has been in the employ of the Becker company for several years.

Edgar J. Rich, Boston, counsel for the Associated Industries of Massachusetts, and for 20 years chief counsel for the Boston & Maine Railroad, was the speaker at a meeting of the New England Iron and Hardware Association at Young's Hotel, Boston, April 20, which was largely attended. Mr. Rich talked on "The Peculiar Railroad Situation in New England."

Cloyd M. Chapman has resigned from the organization of Westinghouse, Church, Kerr & Co., Inc., and has opened an office at 171 Madison Avenue, New York, for the practice of consulting engineering.

Reuben S. Morse, Greenfield, Mass., has resigned his position with the Greenfield Tap & Die Corporation to accept a position in the engineering department, Norton Co., Worcester.

The Combustion Engineering Corporation, 11 Broadway, New York, manufacturer of stokers, grates and other boiler room equipment, announces with regret the resignation of its vice-president, in charge of sales, E. P. Moritz, on account of ill-health. No successor to Mr. Moritz has been named.

Maxwell C. Maxwell, formerly assistant general superintendent Yale & Towne Mfg. Co., has been appointed general superintendent.

W. B. Walker, purchasing agent Columbia Motors Co., Detroit, has resigned and will immediately join the Du Pont Motor Mfg. Co., Wilmington, Del.

Sarnia Bridge Co., Ltd., Sarnia, Ont., Can., has been reorganized under a Dominion charter with ample capital and a strong directorate. Roy M. Norton becomes the president and has associated with him H. B. Fenton as vice-president.

Mitchell S. Little, president and treasurer M. S. Little Mfg. Co., brass nuts, offsets, etc., Hartford, Conn., and formerly secretary Whitlock Coil Pipe Co., has been elected president of the Smyth Mfg. Co., Hartford, bookmaking machinery, in place of Robert H. Schutz, who resigned because of ill-health. Mr. Schutz was elected vice-president.

J. B. Clark, general superintendent of the blast furnaces and steel works of the American Steel & Wire Co., Donora, Pa., has returned from a long vacation at Hot Springs, Ark., and other resorts.

Charles L. Bennett, special representative of the Page Steel & Wire Co., has been placed in charge of the combined offices of its Cleveland and Detroit territories with headquarters at 818 Guardian Building, Cleveland.

Edwin Schofield has been appointed exclusive Canadian representative of the Falcon Steel Co., Niles, Ohio, sheet manufacturer. His main office is at 24 Dalhousie Street, Toronto, and he has a branch office at 24 Victoria Square, Montreal.

J. J. Blommer, assistant to the president American Steel & Wire Co., Chicago, has accepted the position of traffic manager, Milwaukee Association of Com-

merce, effective May 1: Mr. Blommer succeeds Frank Barry, who resigned after six years of service. The Milwaukee Association has engaged J. C. Pinney, dean of the department of engineering, Marquette University, Milwaukee, as consulting engineer on the proposed $10,000,000 rail-and-lake terminal project under contemplation.

H. F. Hallman, for many years pig iron sales agent for the Warwick furnaces, Eastern Steel Co., Pottstown, Pa., has resigned, effective May 1, and will open a sales office in the Real Estate Trust Building, Philadelphia, representing W. L. Byers & Co., Uniontown, Pa., coal and coke, and will also sell pig iron for Eastern furnaces. Frank W. Jones, district sales agent in Philadelphia for the Eastern Steel Co., will add to his duties that of sales agent for Warwick iron.

Private Operation of Merchant Marine Is Favored

WASHINGTON, April 20.—Ownership and operation of the American merchant marine by private interests has been further emphasized during the past week as the policy of the administration. There have been declarations on the subject by Admiral W. S. Benson, chairman of the Shipping Board, and Secretary of Commerce J. W. Alexander, who, next to the President, will have more to do than any other officials with the shaping of policies in the absence of any legislation. A definite step toward expediting the sale of the ships was taken during the week by a conference of business men from different sections of the country, held under the auspices of the Shipping Board. This conference showed an overwhelming sentiment in favor of the placing of Government fleets in private hands on sales terms that would enable American buyers to hold their own with foreign competitors. The conference resulted in the appointment of a committee, headed by Eugene Meyer, managing director of the War Finance Corporation, which will draw up for the guidance of the board a plan for the selling of the ships, with specific suggestions on financial problems involved.

Those in attendance at the conference represented large industries who view the situation more from the standpoint of the exporter rather than that of the ship owner. The general trend of the expressions of opinion seemed favorable to a lowering of prices fixed by the Shipping Board on its vessels, and the making of easy terms to attract capital to American shipping. The conference adopted a resolution to the effect that "the ships shall be sold at prices and on terms that will encourage investment of American capital."

Active Demand for Sheets From Automotive Industries

YOUNGSTOWN, OHIO, April 19.—Some third and fourth quarter business from the regular trade is being considered by sheet makers, but the strike will force a large volume of second quarter tonnage into the third quarter. Two new sheet makers are finding plenty of business in sight from the automotive industries, with heavy demand for black sheets. A sale of blue annealed "seconds" in carload lots is reported at 6.50c. at the mill. Blue annealed has been booked recently at a price spread from 5.50c. to 7c., with 6.50c. as a fair average.

A leading sheet maker reports March output of finished product was 90 per cent of normal.

Western sales representatives of Valley sheet makers report fresh demands.

The current strike bears out predictions of leading executives in the district of unsettled industrial conditions during the year and the continuance of conservative sales policies for an indefinite period.

There has been a slight recession in sheet bar prices, open-hearth bars being quoted at $80 to $85 and Bessemer at $75 to $80. As in finished lines, there will be little semi-finished material available on books of producers until labor and operating conditions become more stabilized.

OBITUARY

Death of William H. Farrell

William H. Farrell, president of the Bridgeport Screw Co., Bridgeport, Conn., died Sunday evening, April 18, at his home, Sound Beach, Conn., after an illness of three weeks. He was born in New Haven Nov. 5, 1865. He is survived by his wife, Emma Ollie Farrell, and his son, Ralph G. Farrell, general manager of his father's company. Mr. Farrell was a brother of James A. Farrell, president of the United States Steel Corporation, and Elizabeth A. Farrell of Brooklyn. He was widely known in the steel and wire industry, having started work in the mills at an early age and rapidly rose to be general superintendent and manager of several plants, notably the Pittsburgh Wire Co., Braddock, Pa.; Page Wire Co., Monessen, Pa.; Salem Wire Nail Co., Salem, Ohio, and others. He built the Union Steel Co.'s plant at Donora, Pa., Dominion Wire Co.'s plant at Montreal, Canada, of which he was president, and later built the Bridgeport Screw Co. plant at Bridgeport, one of the largest of its kind in the country. He was an enthusiastic yachtsman, owner of the schooner yacht *Mystery*, formerly the *Elmina*, winner of the "Astor Cup," and the sloop *Senora*, well known in Long Island Sound regattas. He was a member of the American Iron and Steel Institute, India House, Engineers' Club and Railroad Club of New York, and several yacht and social clubs of Bridgeport and New York.

WM. H. FARRELL

ARTHUR B. BELLOWS, a director and general manager of the Pittsburgh Testing Laboratory, died at his home in the East End, in that city, on Saturday, April 17. He was a graduate of Walpole Academy, Phillips Academy and the Massachusetts Institute of Technology. He went to Pittsburgh in 1900, and became identified with the Pittsburgh Testing Laboratory. Mr. Bellows was a member of the Traffic Club of Pittsburgh, Pittsburgh Railways Club and Engineers' Club of New York.

WILLIAM J. MCMARTIN, president and general manager Winnipeg Ceiling & Roofing Co., Ltd., Winnipeg, Can., died recently of double pneumonia. He was born in Martintown, Glengarry county, Ont., Dec. 6, 1870. He founded the Winnipeg Ceiling & Roofing Co. in 1904. Among his other business connections were: president Edmonton Metal Works, Ltd., Edmonton; treasurer Sheet Metal Mfg. Co., Calgary; president Duluth Corrugating Co., Duluth, Minn., and president Economy Foundry Co., Portage la Prairie, Man.

E. C. SIMMONS, founder of the hardware company which bears his name, died of heart disease at his home in St. Louis on April 18. He had lived in that city since 1846, his first job being with the wholesale hardware concern of Child, Pratt & Co. The Simmons Hardware Co. was incorporated Jan. 1, 1874, reputed to be the first mercantile corporation in the United States, with a cash capital of $200,000. The capitalization has been increased to $4,500,000 at the present time.

GEORGE SCHANTZ, the Dayton Iron & Steel Co., Dayton, Ohio, jobber in iron, steel and heavy hardware and automotive equipment, died recently.

ROGER C. SULLIVAN, chairman board of directors The Independent Pneumatic Tool Co., Chicago, died on April 14. Mr. Sullivan was prominent in political and business circles.

STRIKERS RETURNING

Mills Resuming in Shenango Valley—Mahoning Plants Still Badly Crippled

YOUNGSTOWN, OHIO, April 20.—In the Shenango Valley, the Carnegie Steel Co., American Steel & Wire Co., American Sheet & Tin Plate Co. and Sharon Steel Hoop Co. have resumed production in many departments. The principal producers are still idle in the Mahoning Valley. It is expected the strikers will return to work before the end of the week, pending consideration of wage claims.

Early Break Expected

YOUNGSTOWN, April 19.—All indications point to an early break in the strike of switchmen and yardmen, to be followed by resumption of industrial operations. After ten days' idleness many of the strikers feel that nothing is to be gained by remaining away from work longer and sentiment is growing to return to their posts. Because of the almost complete paralysis of iron and steel production, however, it will take several weeks before the plants are able to get on a pre-strike basis. Immediate suspension of operations indicates to what extent iron and steel producers in this territory were dependent upon daily fuel shipments to maintain schedules. The strike also emphasizes the desirability of making provision for the storage of coal in as large tonnages as possible, such as the Republic Iron & Steel Co. contemplates by creation of a five-acre storage yard for coal, limestone and dolomite.

As in the coal miners' strike, the Carnegie Steel Co. has been enabled to maintain the best operating schedules in the district by drawing upon meager stock piles. Operating officials have also concentrated attention upon those units which require minimum fuel.

At the end of the week, blast furnace operations had been reduced to four active stacks of 25 in the Mahoning Valley, while only a single battery of by-product coke ovens by one company was producing coke. Coal was hauled by motor truck to keep the remaining ovens on gas.

The Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. were practically flat. The Brier Hill Steel Co. managed to keep all of its sheet mills rolling during the week, but the Empire hot mills at Niles suspended Saturday. The Trumbull Steel Co. at Warren maintained its schedules on a 50 per cent basis, but reported difficulties were being encountered in storing output, none of which was being moved. Its tin mills at the Liberty works near Leavittsburg were forced to suspend. The Sharon Steel Hoop Co. operated until April 15, when it was compelled to suspend in all departments. At the Carnegie company, the open hearth plant is idle, and metal from its active smelters is converted by the Bessemer department. Operations were appreciably slowing down at the week-end in the puddling department of the A. M. Byers Co. at its Girard plant. Its furnace is banked.

Smaller plants are faring better in some cases than the larger consumers of coal. At Newton Falls, Trumbull county, the Newton Steel Co. is maintaining rollings at four mills, started about first of the month, and affording employment to 700 men. Four additional units in the original layout will be delayed in starting, however. The company is completing a building to afford housing accommodations for 100 men, because of limited housing facilities in the village.

The Falcon Steel Co. has also been fortunate in being enabled to continue production at its new Niles plant, although on a reduced scale.

Sheet making units of the Republic Iron & Steel Co., Youngstown Sheet & Tube Co., Mahoning Valley Steel Co. and Sharon Steel Hoop Co. have wholly suspended.

Fabricators, who use small quantities of coal in comparison with the steel makers, have maintained production on a basis approaching normal. The General Fireproofing Co. is producing as usual. The Truscon Steel Co. operates largely by electric power and has not been forced to curtail to any extent. In the Sharon and New Castle districts, fabricators kept their plants going.

The Portage Silica Co. shipped a trainload of foundry sand to a Sharon, Pa., consumer, railroaders consenting to work on a through train, but not on a local.

Representatives of the railroad brotherhoods have denounced the strike in unequivocal terms and have appealed to the men to return to work until the differences can be adjudicated in the ordinary methods.

At the end of the week, over 200,000 tons of sheets, tinplate and other finished products had accumulated in the Youngstown district. Value of the piled material was estimated at $15,000,000 by industrial leaders. Since the beginning of the railroad strike 50,000 tons of product have accumulated, despite reduced production.

None Forced to Suspend

Iron and steel manufacturing plants in the Harrisburg, Pa., district were forced to curtail only slightly their operations last week during the "outlaw" railroad strike, and in no instances, was any forced to suspend operations. The coal supplies, in several instances were getting dangerously low, and in practically every plant near Pennsylvania's capital city large tonnages of the finished product were piled about because of the difficulty of making freight shipments.

Buffalo Plants Resuming

BUFFALO, April 19.—Steel plants here are gradually resuming after the strike. The furnace situation shows four banked Lackawanna Steel Co. furnaces resuming. A number of rolling mills will be started within a few days. Two Donner Steel Co. mills have resumed this week. The Donner furnaces are going into heavier production. Four Rogers-Brown furnaces are being relighted. Buffalo Union and Wickwire plants were normal throughout the strike.

C. W. Laughlin and Harry Barney, formerly of Laughlin-Barney Machinery Co., Inc., have opened offices at 819-821 Wabash Building, Pittsburgh, under the firm name of Laughlin & Barney, and will act as manufacturers' representatives for machine tools, hot and cold metal working machines, cranes and hoists. The new firm will represent all the concerns formerly represented by the Laughlin-Barney Machinery Co., and a petition has been filed in the courts for dissolution of the latter named concern.

The Electric Furnace Construction Co., Philadelphia, reports the following appointments of agents for "Greaves-Etchells" electric steel furnaces: H. M. Smith, 309 Schofield Building, Cleveland; A. S. Lindstrom, 519 California Street, San Francisco; McCrum & Gillem, 1011 Empire Building, Birmingham, Ala.; D. P. Morisseau, General Welding & Supply Co., Wainwright Building, St. Louis.

The Penn-Okla Oil Corporation, organized with a capital of $500,000, with $150,000 provided for as cash capital to carry on the business, has opened general offices at 230 Fifth Avenue, Pittsburgh. Samuel J. Black is president and treasurer; W. P. Dunbar, vice-president and sales manager, and W. W. Millar, secretary. The new company, which will deal in crude oil, fuel oil, gasoline, naphtha, kerosene, etc., states it is now making connections direct with refiners for supplies of the above products.

Arthur G. McKee & Co., Cleveland, engineers and contractors, have just closed a contract with the American Manganese Mfg. Co., Dunbar, Pa., for relining and repairing its No. 2 blast furnace which was recently blown out.

Machinery Markets and News of the Works

BUSINESS HANDICAPPED

Good Volume of Orders, However, Considering Difficulties

Prospects of a Machinists' Strike Now Appear—Cincinnati and Eastern Districts May Be Affected

In spite of all handicaps the machine-tool industry continues to prosper, orders during the past week of railroad troubles having been surprisingly good. There was some evidence of slowing down, but business was really better than might have been expected under the circumstances.

Apparently not all of the troubles for the metal-working industries are passed, for the latest development is a prospective strike of machinists on May 1. This has been talked of for some weeks as a possibility in the Cincinnati district, but the East is also likely to be affected, the International Association of Machinists having presented new wage demands and a demand for the closed shop. It is stated that 40,000 men will be called out in the event that the demands are not met.

Scarcity of raw materials and the inability to get shipments in or out is handicapping many industrial plants, including the machine-tool manufacturers. Some manufacturers have laid off workmen because of an insufficient supply of raw materials.

There was good buying last week in New York, some fairly large orders being placed. In Boston the General Electric Co. bought for several of its New England plants. In Chicago and Cleveland a slowing-up was noted, due chiefly to the accumulation of troubles, but more particularly to the railroad situation.

Cincinnati reports a good export demand, orders from Spain, South America and Japan having been placed. A large machine-tool company in New York has recently received an order for about $1,000,000 of shop tools from a Cuban railroad. The Texas & Pacific Railroad has bought $140,000 worth of new shop equipment and the Lehigh Valley Railroad last week wound up purchases on its recent list. The New York Central is inquiring for a few tools. The Pennsylvania Lines West has bought small lots of tools at Pittsburgh for its Ohio shops.

New York

NEW YORK, April 20.

The railroad strike and the embargoes on freight shipments which came as a result of it supplied the finishing touch to the struggles which Eastern metal-working industries have been making in the past few months against ever-increasing odds. The shortage of raw materials and the apathy of labor in getting out maximum production have been scarcely less troublesome than the difficulty in getting or making shipments via the railroads. A plant in Brooklyn practically shut down on Monday because of its inability to get in raw materials and ship out the finished products. Other plants have laid off a part of their working forces. Next on the program may be a strike of machinists. Demands have been presented in the Eastern district and in the Cincinnati district, and if these demands are not complied with strikes may occur on May 1. In the East the district organization of the International Association of Machinists has asked for a new wage scale and the closed shop. The wages asked for are in some instances no more than many of the metalworking shops are paying at present, but the closed shop is an issue on which a break may come if the union insists too strongly. The machinists claim that 40,000 men will quit work, but as this membership is scattered among many plants it is possible that no widespread shutdowns will result from a strike. The wage demands of the machinists are as follows: Toolmakers, $1.10 an hour; machinists and riggers, $1; specialists, 80 cents; helpers, 75 cents; women helpers, 60 cents; apprentices, 30 cents for first six months, 40 cents for six months thereafter, 50 cents for the second year, 65 cents for the third year, 75 cents for the fourth year, and the regular minimum thereafter. Double time for overtime; 30 minutes intermission before overtime and single time during intermission; night work to consist of 40 hours' work during five nights, with 25 per cent over the day rate to be paid for night work, are some of the other union demands.

Even with these difficulties, the metal-working industry is prosperous and continues to buy machine tool and other equipment. In the past week, despite the railroad strike, local machine-tool sellers did a very good business, surprisingly good, in fact. An index of the need for tools is the heavy demand for second-hand equipment, as new tools cannot be procured quickly enough to suit the requirements of many manufacturers.

The West Virginia Metal Products Co., Fairmount, W. Va., whose purchasing office is in New York, bought about 20 tools last week for a machine shop. Other buyers were the Gillespie Motor Corporation, Paterson, N. J.; the Singer Mfg. Co., Bridgeport, Conn.; the Oxweld Acetylene Co., Newark, N. J.; the Simms Magneto Co., East Orange, N. J.; the Van Sicklen Speedometer Co., Newark, N. J., and Toledo, Ohio; the Doehler Die Casting Co., Brooklyn; the International Motor Co., Plainfield, N. J., and the Willys Corporation, Elizabeth, N. J. The latter has its new automobile plant well under way and merely rounded out its equipment purchases in certain lines. The Lehigh Valley Railroad completed purchases on its reeent list, having bought 30 or more tools. A large order came to New York from the Texas & Pacific Railroad, amounting to about $140,000 worth of railroad shop tools. This road's repair shop in Texas recently burned and the new equipment is to replace that destroyed. Another large railroad order, amounting to about $1,000,000, has been received by a large machine-tool company from a Cuban railroad. The New York Central Railroad has inquired for a few tools and the Delaware, Lackawanna & Western is expected to issue a list soon.

The American Chain Co., Bridgeport, Conn., has issued a list of new equipment, mostly for a forge shop, including hammers, presses, etc.

Business in overhead traveling cranes is dull, but builders of locomotive cranes and some manufacturers of hand-power cranes and hoists report a fair volume of inquiries, among which are a number for export to South America and Cuba. The few new inquiries for overhead cranes that have been issued recently are to a great extent for cranes of small capacity. Some inquiries that have been out for some time are developing into orders. Among companies that have recently purchased overhead traveling cranes are the Walsh-Holyoke Boiler Co., Holyoke, Mass., three 20-ton; the McCarter Iron Works, Norristown, Pa., one 10-ton, and the Bartlett Hayward Co., Baltimore, one 5-ton.

Inquiries have been sent out by the Kennedy-Van Saun Mfg. & Engineering Co., 120 Broadway, New York, for one 30-ton, 10-ton and 5-ton overhead traveling cranes and P. S.

Nicholson & Co., 31 Pine Street, New York, for a small overhead traveling crane for export.

Among recent sales are: The Shepard Electric Crane & Hoist Co., a 5-ton, 32-ft. span, overhead traveling crane to the Seymour Mfg. Co., Seymour, Conn., a 4-ton grab bucket crane to the Dow Chemical Co., Midland, Mich., and a 5-ton, 43-ft. span overhead traveling crane to the Cleveland Tractor Co., Cleveland; the American Hoist & Derrick Co., a 15-ton locomotive crane to the Eastern Connecticut Power Co., Norwich, Conn.

Karasik, Friedman & Co., New York, have been incorporated with a capital stock of $100,000 by J. D. Karasik, H. London and E. Lichtenberg, 113 West 114th Street, to manufacture iron and steel products.

A one-story power plant, 52 x 61 ft., to cost about $28,000, will be erected by the National Sugar Refining Co., Dock Street, Long Island City, N. Y.

The Carmichael 8-in-1 Fuse Plug Corporation, New York, has been incorporated with a capital stock of $100,000 by H. and E. Carmichael and S. E. Haupt, 201 East 115th Street, to manufacture fuse plugs and other electrical specialties.

The Wright Aeronautical Corporation of America, 40 Wall Street, New York, has decided to defer the erection of its proposed new plant at Newark, N. J., estimated to cost about $300,000. For occupancy about May 1, it has leased a four-story, steel and concrete building, 75 x 300 ft., at Paterson, N. J., with adjoining site comprising about 7½ acres, and will establish its plant at this place. The property is valued at $500,000 and the company has privilege of purchase. Employment will be given to about 500 for initial operations. It is a successor to the Wright-Martin Corporation.

The Allied Storage Battery Co., Montclair, N. J., has been incorporated with a capital stock of $50,000 by F. S. and Beverly Weilbacher, and William Von Hollen, to manufacture electric storage batteries.

The Richardson & Boynton Co., Dover, N. J., manufacturer of boilers, furnaces, etc., is arranging for the installation of new electric equipment, including motors, compressor, etc.

The Westinghouse Lamp Co., Bloomfield, N. J., is arranging to break ground at once for an addition to its plant in the Watsessing district, to cost in excess of $750,000.

Joseph A. Erbacher, Inc., 465 Main Street, East Orange, N. J., has been incorporated with a capital stock of $125,000 by Joseph A., Henry C. and Fred H. Erbacher to manufacture hardware products.

The Ayars Machine Co., Salem, N. J., manufacturer of canning machinery, has increased its capital stock from $100,000 to $200,000.

The Gilbert-Grant Co., North Avenue, Plainfield, N. J., has been incorporated with a capital stock of $125,000 by Cornelius P. Kitchel, W. G. Bates and Frank J. Price to manufacture cranes, hoists and kindred machinery.

The Schelling Hardware Co., Hoboken, N. J., has been incorporated with a capital stock of $50,000 by Louis and George Schelling and J. Albert Mayer to manufacture hardware specialties.

The White Metal Mfg. Co., 1006 Clinton Street, Hoboken, N. J., manufacturer of collapsible tubing, etc., has awarded contract to the Industrial Engineering Co., 30 Church Street, New York, for additions, 135 x 135 ft. and 20 x 80 ft., for general metal working and a foundry respectively.

The Boat Repairing Corporation, foot of Communipaw Avenue, Jersey City, N. J., has filed plans for five one-story shop buildings to cost $58,000. The structures will be of various sizes, with cost of the largest shops $17,000 and $18,000 respectively.

The American Tube & Bending Co., 17 Paterson Street, Harrison, N. J., has been incorporated with a capital stock of $100,000 to manufacture iron and steel castings and other products. Peter Mackiewicz heads the company.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, has filed plans for a foundry on a site at Newark, N. J., aggregating 520 x 1380 ft. It will be one-story, 120 x 240 ft., with two wings, 116 x 220 ft. and 116 x 180 ft. respectively. With equipment it will cost about $402,000.

The Lux Mfg. Co., 123-33 East Kinney Street, Newark, N. J., manufacturer of tungsten and nitrogen lamps, is planning for an addition to its works to duplicate the present four-story factory and providing a total manufacturing space of about 80,000 sq. ft. Otto Foell is vice-president and works manager.

The Elizabeth Foundry Co., Newark, has been incorporated with a capital stock of $200,000 by George W. W. Porter, Gustave Haussling and Alfred W. Cooper to manufacture iron and brass castings.

The General Machine Co., 397 Market Street, Newark, has had plans prepared for a one-story machine shop addition to cost about $14,500.

The Accounting Machine Co., 238-48 Badger Avenue, Newark, manufacturer of accounting machines and tabulating devices, has completed plans for a two-story plant, 81 x 111 ft., to cost about $75,000. A boiler department will be provided. William E. Lehman, 738 Broad Street, is the architect.

The Vreeland Motor Co., 407-9 Elizabet Avenue, Newark, manufacturer of motor trucks, has completed plans and is taking bids for the erection of its proposed new plant on Coit Street, Irvington. The initial works will comprise a number of one- and two-story buildings, 280 x 600 ft., 200 x 250 ft., and 50 x 180 ft., consisting of machine shop, general metal-working department, assembling works, etc. E. E. Vreeland is president; John T. Simpson, Essex Building, is architect. The plant is estimated to cost about $350,000.

The Continental Smelting & Refining Co., Newark, N. J., has been incorporated with a capital stock of $25,000 by Edward H. Beck, Conrad S. Torresson and Robert C. Beck, Jr., to manufacture metal specialties.

The Arrow Motor & Machine Co., 208 Broad Street, Elizabeth, N. J., has been incorporated with a capital stock of $250,000 by Welcome W. Bender, Harry Siegel and Frank J. Burns, to manufacture marine motors.

The American Numbering Machine Co., 226 Shepherd Avenue, Brooklyn, has awarded contract to Oliver B. Lafrenere, 215 Montague Street, for a two-story addition, 50 x 100 ft., at the corner of Shepherd and Atlantic avenues, to cost about $40,000.

The Greer Electric Construction Co., New York, has been incorporated with a capital stock of $50,000 by J. Greer, C. F. Zweifel and P. R. Kuhn, 1343 Lexington Avenue, to manufacture electrical products.

The Sterling Motor Truck Co., Twelfth Avenue and 132d Street, New York, has increased its capital stock to $100,000.

The Self-Winding Clock Co., Grand and Willoughby avenues, Brooklyn, is planning for extensions and improvements to cost about $100,000.

The Lauraine Magneto Co., Thirteenth and Ely streets, Long Island City, N. Y., is planning for the installation of new machinery at its plant, including milling machines, drill press, grinders, etc.

The United States Utilities Corporation, New York, has been incorporated with a captial stock of $105,000 by E., M. and J. Ullman, 470 West 150th Street, to manufacture metal products.

The Advance Boiler Corporation, New York, has been incorporated with a capital stock of $500,000 by T. and G. W. Moffitt and J. J. Schmitt, 337 Second Avenue, to manufacture boilers and boiler equipment.

The J. & M. Electric Co., Utica, N. Y., manufacturer of electrical specialties, has been reorganized with an active capital stock of $111,000.

The Board of Trustees, Columbia University, New York, is having plans prepared for the erection of a new electric power plant at the Teachers' College, at 120th Street, near Broadway, with estimated cost in excess of $100,000, including equipment.

The Davidson Tool Mfg. Co., 122 Maiden Lane, New York, has increased its capital stock from $250,000 to $500,000.

The Clermont Machine Co., New York, has been incorporated with a capital stock of $30,000 by N. Monfort, A. O. Brill and C. Surico, 2958 Eighty-sixth Street, Brooklyn, to manufacture machinery and parts.

The Industrial Rubber Corporation, Long Island City, N. Y., has been incorporated with a capital stock of $100,000 by M. Bolden, L. Price and E. L. Alexander, 385 Central Park West, New York, to manufacture mechanical rubber goods.

The Eagle Textile Machinery Corporation, New York, has been incorporated with a capital stock of $25,000 by D. and A. Grushevsky and J. Cohen, 47 Norfolk Street, to manufacture textile machines and parts.

The Keystone Metal Spinning & Stamping Co., New York, has been organized by J. and L. Levine, 545 Powell Street, Brooklyn, to manufacture metal products.

The Millers Falls Co., 28 Warren Street, New York, manufacturer of tools and machinery, with plant at Millers Falls, Mass., has had plans prepared for improvements and extensions to cost about $25,000.

John Reid & Co., New York, have been incorporated with a capital stock of $500,000 by John Reid, A. J. Michel and C. H. Lane, 607-A Halsey Street, Brooklyn, to manufacture marine engines and boilers.

J. Livingston & Co., 70 East Forty-fifth Street, New

York, manufacturers of electrical fixtures, have increased their capital stock from $450,000 to $600,000.

The Federal Signal Co., Troy Road, Albany, N. Y., manufacturer of power and automatic signals, etc., has awarded contract to the Flynt Building & Construction Co., Palmer, Mass., for a one-story foundry addition, 120 x 200 ft., to cost about $100,000, including equipment.

Moller & Haefner, Inc., Brooklyn, has been incorporated with a capital stock of $10,000 by E. S. Moller, E. F. Haefner and J. Goss, 555 Clinton Street, to manufacture machine parts, tools, etc.

The municipal electric power plant, estimated to cost about $160,000, referred to last week, will be located at Herkimer, N. Y., instead of Utica, as stated. The work will comprise an addition to the present plant. The Municipal Commission, City Hall, Herkimer, is in charge; Michael Foley, president. H. B. Sweet, Clarendon Building, Utica, is the architect and engineer.

The Lord Dry Dock Co., 105 West Fortieth Street, New York, a subsidiary of the Lord Construction Co., is planning for the purchase of machinery for its proposed new drydock and ship repair plant at North Bergen and Guttenberg, N. J.

The Pratt Corporation, Frankfort, N. Y., has been incorporated with a capital stock of $800,000 by J. Miller, J. F. Hubbell and J. D. Judson, Utica, to manufacture metal products.

The National World Products, Inc., New York, has been incorporated with a capital stock of $250,000 by J. Depay, H. D. Winter and J. M. Ross, 344 West Seventy-second Street, to manufacture special machinery and other metal products.

The Phono Motor Mfg. Co., Inc., 325 Dean Street, Brooklyn, manufacturer of small motors, etc., has increased its capital stock from $25,000 to $100,000.

The United States Cast Iron Pipe & Foundry Co., 71 Broadway, New York, with plants at Burlington, N. J., Anniston and Birmingham, Ala., and other locations, denies the report of any proposed merger with the Iron Products Co., 30 West Street, recently formed to take over the Central Foundry Co. and other interests.

The R. W. Bush Hardware Co., Gouverneur, N. Y., has been incorporated with a capital stock of $45,000 by J. Hance, H. J. and R. W. Bush to manufacture hardware products.

The Wilson-Armstrong Mfg. Co., New York, has been incorporated with a capital stock of $100,000 by A. Rothstein, A. Skillman and H. A. Kashden, 120 Broadway, to manufacture iron and steel products, motors, etc.

The Hudson Brass Works, 16 Nassau Street, Brooklyn, manufacturer of plumbers' brass goods, etc., has awarded contract to John A. Wert, 38 Lafayette Street, Ogdensburg, N. Y., for a one-story plant on Ford Street, Ogdensburg, 100 x 300 ft., to cost about $65,000.

The Northern Machine Corporation, Watertown, N. Y., has been incorporated with an active capital stock of $157,500 by W. D. Ogsbury, W. J. Young and F. K. Purcell, to manufacture paper mill machinery.

Frederick A. Sondheimer, 138 Temple Street, Long Island City, N. Y., manufacturer of factory equipment and supplies, has filed plans for a two-story brick plant, 49 x 100 ft., on Marion Street, near Freeman Avenue, to cost about $45,000.

The Mande Corporation, New York, has been incorporated with a capital stock of $32,500 by H. Brill, C. A. Brodek and F. L. Haver, 44 Cedar Street, to manufacture engines and boilers.

The Bagley & Sewall Co., Watertown, N. Y., manufacturer of pumping machinery, grinding equipment, castings, etc., has awarded a contract to the Austin Co., 217 Broadway, New York, for a one-story addition, 130 x 200 ft., to cost about $70,000.

The American Name Plate Mfg. Co., Brooklyn, has been incorporated with a capital stock of $25,000 by S. and I. H. S. Zerlip and W. Rosenfeld, 363 Seventh Street, to manufacture metal name plates and other specialties.

Harry Lozier, Inc., Albany, N. Y., has been incorporated with a capital stock of $105,000 by H. A. Lozier, J. B. Hulett and W. N. Whitman, 42 Broadway, New York, to manufacture motor cars.

The Packard Motor Car Co., Broadway and Sixty-first Street, New York, has filed plans for the erection of its proposed three-story service and repair building, 200 x 480 ft., on Bedford Avenue, near Sullivan Street, Brooklyn, to cost about $200,000.

New England

BOSTON, April 19.

The General Electric Co., West Lynn, the past week covered on a large number of miscellaneous tools for its Hudson, West Lynn, Pittsfield, Bridgeport and North Easton plants and is temporarily out of the market for any large lots. There is a possibility, however, of the company completing its 1920 list within two months, but much depends on industrial conditions.

Inquiries have held up well, but machine-tool dealers state contracts are not fast in closing. F. O. Wells, formerly president Greenfield Tap & Die Co., Greenfield, Mass., has bought a small plant which is being equipped to manufacture special machinery and has purchased an American 16-in. lathe and other tools. The New England Confectionery Co., Boston, bought a 14-in. geared head lathe; A. Hankey & Co., Rochdale, Mass., a 24-in. lathe, and J. Briggs & Sons Co., Providence, R. I., jewelry manufacturers, considerable machine shop equipment in addition to a lathe previously reported. B. A. Ballou, Providence, jewelry manufacturer, has taken a milling machine; the industrial school, Hyde Park, Boston, two machine tools, and a Government school four tool room grinders, two upright drills and three other machines. The New England Westinghouse Co., Springfield, Mass., is a steady buyer of production equipment in a small way. It is operating its new punch shop and is pushing construction on another new shop. The Newport Torpedo Station, Newport, R. I., has contracted for two small single spindle drills and is asking bids on several other tools. The Rolls-Royce Co. of America, Springfield, Mass., has taken a few individual machines. Transportation of its equipment from Ohio to the new plant has been seriously delayed and it is feared automobile production will not begin as early as anticipated. The Hulbert & Rogers Machine Co., Sudbury, Mass., bought five 20-in. planers, three grinders, miscellaneous sized lathes, milling machines, a Pratt & Whitney spline, furnaces and hardening equipment. The Taft-Peirce Mfg. Co., Woonsocket, R. I., machinery and tools, is expected to take definite action on its list, including lathes, milling machines, screw machinery, etc., for the addition to its plant. The Eastern Massachusetts Street Railway Co. has not covered on the two car wheel lathes wanted. The Boston Elevated Railway is in the market for a 24-in. or 25-in. single friction 10-ft. bed engine lathe and a broaching machine. The American Radio & Research Corporation, Medford Hillside, Mass., wireless outfits, is interested in a small amount of equipment. It is occupying the former Medford pumping station, but is building a new plant. The Trimont Mfg. Co., Boston, has not covered on its needed equipment. The Farrell Foundry & Machine Co., Ansonia, Conn., is in the market for one 7-ft. and one 8-ft. planer; the Mills Woven Cartridge Belt Co., Worcester, Mass., is inquiring for a large lathe and the Century Washing Machine Co., Springfield, Mass., is making inquiries on tools for its new Holyoke plant, but is not yet ready to buy. F. H. Talbot, Portland, Me., machinist, purchased a small amount of equipment. The Automatic Shoe Heel Mfg. Co., Boston, has bought machinery for making molds, and interests which recently took over the Sylvester plant at Danversport, Mass., purchased foundry handling equipment.

The Government will soon buy a 10-ton crane for the Portsmouth Navy Yard. The local crane market appears to have flattened during the past fortnight. Some inquiries are still in the market, but the general opinion is that purchases have been abandoned.

Prices on tools hold very strong. Manufacturers who did not advance prices the first of April in some instances have signified their intention of doing so before May 1. The railroad labor trouble has seriously checked the movement of new tools into New England. A few machines have been brought via the New York Central Railroad to Norwood, N. Y., then across to Vermont, where connection was made with the Rutland Railroad and subsequently with the Central Vermont to New London and other points. In such instances freight rates were very high, but manufacturers were willing to pay anything to secure the needed tools.

Second-hand tools are in good demand, mostly in single machines and at firm prices.

The plant of the Palmer Foundry & Machine Co., Palmer, Mass., was destroyed by fire April 13, throwing 75 men out of employment. The estimated loss is approximately $100,000, including new equipment recently purchased. Edwin W. Lynch is president and general manager. No plans for rebuilding have yet been made.

Foster, Merriam & Co., iron and brass founders, Meriden, Conn., have sold to New York and Hartford bankers $177,500 7 per cent cumulative preferred stock and with the proceeds will build additions to the foundry which will double

the present output. About three months ago the output was increased about one-third by extensions. R. W. Millard is president.

The Canbec Mfg. Co., Attleboro, capitalized for $50,000, has been chartered to manufacture fire extinguishers. Joseph Stanislas Beauregard, Narragansett Hotel, Providence, R. I., is president, and Charles Le Roy Ryerson, Boston, treasurer.

New public garages are contemplated as follows: Patrick B. Mutrie, 11 Pearl Street, Boston, 90 x 120 ft., and George E. Kimball, 179 Norfolk Street, Dorchester, 12,000 sq. ft.; Robertson Motor Co., 526 South Main Street, Fall River, Mass., 140 x 150 ft.; Nelson Bouchard, 15 Silver Street, Norwood, Mass., 40 x 130 ft.; Lachapelle & Bouger, Main Street, Holyoke, Mass., 60 x 150 ft.; Edward Gray, 138 Merrimac Street, New Bedford, Mass., 34 x 150 ft.; Diamond Co., 244 Westminster Street, Providence, R. I., 48 x 140 ft.; Morin, Peters & Monico, Inc., 329 Park Street, Bristol, Conn., 65 x 120 ft.; J. P. Nelson, 40 Temple Street, Hartford, Conn., 50 x 140 ft.

The Fall River Bleachery, Fall River, Mass., is constructing a one-story, 62 x 242 ft. machine shop.

The Emerson Apparatus Co., Boston, contemplates the erection of a one-story manufacturing building, 40 x 200 ft., in Melrose, Mass.

The Natick Building Association, Natick, Mass., has awarded a contract for a one-story building, 52 x 82 ft., to be operated by the New England Pressed Steel Co.

New England contractors are figuring on three buildings of mill construction to be erected in the near future by the Munson Mill Machinery Co. at Utica, N. Y.

The M. S. Wright Co., 51 Jackson Street, Worcester, Mass., manufacturer of vacuum cleaners, will be in the market for considerable machinery in the next few months for equipping additional manufacturing space and will require light presses, automatics, drilling machine, milling machines and lathes, also some general equipment. It has just purchased the factory of the Mills Woven Cartridge Belt Co., Worcester, which contains 170,000 sq. ft. of floor space, a small portion of which will be leased to the Mills company. The M. S. Wright Co. employs a force of 650 which will be increased to 1200 before the end of the summer.

Hubbell Harvey, Inc., State Street and Bostwick Avenue, Bridgeport, Conn., manufacturer of switches, plugs and other electrical specialties, is having plans prepared for a four-story addition, 60 x 225 ft.

The Vogel-Forsberg Mfg. Co., New Britain, Conn., has been incorporated with a capital of $50,000 by P. H. and G. A. Vogel and G. A. Forsberg, to manufacture tools, dies and other metal products.

The Waterbury Foundry Co., Waterbury, Conn., has increased its capital stock from $40,000 to $100,000.

The Leonard Die-Head Co., Bridgeport, Conn., has been incorporated with a capital stock of $50,000 by H. T. Leavenworth, Bridgeport, and J. B. Dillon, Shelton, to manufacture metal products.

The Bethlehem Shipbuilding Corporation, Quincy, Mass., has awarded a contract to the Snare & Triest Co., 8 West Fortieth Street, New York, for a three-story, concrete and steel shop addition at its Fore River plant, 50 x 225 ft., to cost about $75,000.

The Bridgeport Brass Foundry Co., Florence Street extension, Bridgeport, Conn., recently incorporated, has been organized with T. C. Lynch as president and Ralph Johnston, secretary and treasurer.

Interests operating the Electric Maintenance & Engineering Works, 143 Railroad Street, Woonsocket, R. I., have dissolved partnership. The business will be continued under the same name by Albert J. Dauray, formerly interested in the company.

The Bullard Machine Tool Co., Broad Street, Bridgeport, Conn., has awarded a contract to J. R. Sheehan, 211 State Street, for the proposed one-story addition to its plant, 50 x 240 ft., to cost about $50,000.

Fire, April 14, destroyed a portion of the plant of the Palmer Foundry & Machine Co., Palmer, Mass., with loss estimated at $100,000.

The Packard Motor Car Co., Springfield, Mass., has completed plans for a two-story service and repair building, 200 ft. long, on State Street, near Hancock Street, to cost about $125,000.

The Narragansett Boiler Works, 281 Dyer Street, Providence, R. I., has been organized to manufacture boilers and boiler equipment. Benjamin A. Lowe, 38 Payton Street, heads the company.

The New England Pressed Steel Co., Natick, Mass., is completing plans for a one-story addition, 55 x 85 ft., to cost about $25,000.

The C. E. Davis Foundry Co., Rutland, Vt., is planning for extensions to its plant and the installation of additional machinery, including a mono-rail system for handling castings, etc.

The Whitins Machine Works, Whitinsville, Mass., is having plans prepared for a two-story brick and reinforced-concrete addition, 60 x 240 ft., to cost about $80,000. J. D. Leland, 185 Devonshire Street, Boston, is architect.

The American Tube Bending Co., New Haven, Conn., manufacturer of metal tubing specialties, has increased its capital stock from $25,000 to $60,000.

Fire, April 8, destroyed a portion of Factory No. 2, of the Bridgeport Metal Mfg. Co., Bridgeport, Conn., with loss estimated at about $20,000.

Philadelphia

PHILADELPHIA, April 19.

The problem of making deliveries is paramount at present. Many tool builders have orders booked for several months ahead, making immediate delivery on new business impossible, and even in cases where machines are ready for shipment, railroad embargoes, due to labor disturbances, prevent arrivals at destinations. There is accordingly a greater proportionate demand for the smaller machines and tools under 70 or 50 lb. in weight which can be shipped by parcel post. Because of these unsettled conditions would-be buyers are postponing inquiries. The Baltimore & Ohio Railroad has a list out for heavy duty machines, which it has not yet closed.

The option on the shipbuilding plants of Pusey & Jones at Wilmington and Gloucester, held by the Baltimore Dry Docks & Shipbuilding Co., expired the middle of last week without the purchase by the latter company.

It is rumored that the interests which were planning the establishment of a plant at Harrisburg to build auto frames, reported in these columns two weeks ago, have abandoned the project.

A. B. Landis & Sons have moved into their recently acquired plant at Cresheim Road and Queen Street, Chestnut Hill, Philadelphia, where they will grind both crank and cam shafts and manufacture automobile parts complete. The building occupies 5000 sq. ft. and provides an increase in former capacity of about 300 per cent.

The Ace Motor Corporation, Erie and Sepivah streets, Philadelphia, which is making a four-cylinder motorcycle, has made changes in its executive staff as well as plans for extensions of operations. It is expected to come into the market for more machinery before long.

The Atlantic Refining Co., Pittsburgh, recently bought a lathe and a threading machine.

The American Storage Battery Co., Cambridge, Mass., is building a plant at Fernwood, Pa., where it will manufacture its complete products.

Fire destroyed three buildings of the plant of the John Wood Mfg. Co., machinist and founder, Conshohocken, Pa., on April 14. Damage was estimated at $200,000. The company recently inquired for presses.

The Keystone Motor Co., East Greenville, Pa., is building in Oakes, near Pottstown, Pa., and is expected to ask for a few tools.

The Hess-Bright Mfg. Co., Front and Erie streets, Philadelphia, manufacturer of ball bearings, etc., is taking bids for the erection of three one-story additions, 32 x 290 ft., 24 x 350 ft., and 32 x 120 ft.

The Standard Electric Welding Co., Philadelphia, has removed its plant from Emerald and Firth streets to a larger establishment at 1939-41 East Sergeant Street.

The Precision Grinding Wheel Co., Holmesburg, Philadelphia, has filed plans for a one-story building, 90 x 265 ft., to cost about $100,000, including equipment.

The Westminster Machine Co., Fifty-eighth and Westminster streets, Philadelphia, has filed plans for an addition.

The Marine Equipment & Supply Co., Philadelphia, has acquired the five-story building at 116 Walnut Street.

The Enterprise Mfg. Co., Third and Dauphin streets, Philadelphia, manufacturer of hardware products, has filed plans for extensions and improvements to cost about $8,000.

Fire, April 15, destroyed the service and repair building of the Kenneth Motor Service Co., 1707 North Twelfth Street.

The General Motors Corporation, 29 West Forty-second Street, New York, with headquarters at Detroit, has acquired the plant of the Doylestown Agricultural Co., Main and Franklin streets, Doylestown, Pa., manufacturer of agricultural implements and machinery, which it will operate for similar production, including tractors, primarily for export. Options on adjoining property have been secured and plans for the erection of an addition for the manufacture of automobiles and farm machinery are contemplated. It is said

that the new plant will cost in excess of $1,000,000 and will be designed to give employment to over 1200. The Doylestown Agricultural Co. has heretofore been owned by Joseph A. and Henry D. Ruos.

The Clay Products Co. of America, Zanesville, Ohio, has completed plans for the erection of a new brick manufacturing plant at New Hope, near Doylestown, Pa., to cost about $500,000, including machinery. R. C. Burton heads the organization.

The Ajax Rubber Co., Breunig Avenue, Trenton, N. J., manufacturer of automobile tires, is considering plans for a four-story addition, 50 x 75 ft., to cost about $50,000.

The Momac Co., Inc., Trenton, N. J., has been incorporated with a capital stock of $100,000 by Charles E. McCullough, Maurice A. Mackey and Stewart H. O'Donnell, to manufacture lighting equipment.

The American Bridge Co., Trenton, N. J., has filed plans for two additions, one-story and two-stories, to its works on Federal Street, estimated to cost $446,000 and $58,000 respectively, including equipment.

Mathew H. Devey, Trenton, N. J., is organizing a company to establish a plant for the manufacture of electrical products of his own invention, including conduits and other specialties. It will be known as the Devey Mfg. Co.

The Alvord Reamer & Tool Co., Millersburg, Pa., is planning for the erection of an addition, 40 x 60 ft.

Proctor & Schwartz, Inc., Sixth Street and Tabor Road, Philadelphia, manufacturer of drying machinery, formerly the Philadelphia Textile Machinery Co., has acquired the plant and business of the Ceramic Equipment Co., Trenton, N. J., recently organized to manufacture a similar line. Operations will continue at Trenton and the plant will be conducted as a separate organization, specializing in the production of dryers, automatic stove rooms, conditioning apparatus, etc. Eugene A. Hults will be president and managing director of the Trenton interest.

Frederick Sabin & Co., Inc., 237 North Broad Street, Philadelphia, manufacturer of heating specialties, will build an addition to its plant at Eighteenth and Courtland streets.

Buffalo

BUFFALO, April 19.

The American Car & Foundry Co., 370 Babcock Street, Buffalo, is planning for the erection of a one-story brick and steel car shop to cost about $200,000, including equipment.

The new plant of the Philadelphia Rubber Works Co., Thirty-seventh and Reed streets, Philadelphia, on the River Road, Buffalo, will comprise five factory units, to be devoted to tire manufacture and rubber reclaiming operations. A power plant will be erected for works service. The project is estimated to cost close to $1,000,000, including equipment. J. S. Lowman is first vice-president.

The North Buffalo Hardware Foundry, Inc., Buffalo, has been reorganized with an active capital stock of $165,000.

The Locke Wade Co., Buffalo, has been incorporated with a capital stock of $100,000 by R. W. Locke, R. M. Stanley and E. H. Gidley to manufacture automobile equipment.

The Herschell-Spillman Co., North Tonawanda, N. Y., manufacturer of automobile motors, has awarded a contract to Hardin & Crea, White Building, Buffalo, for the erection of a four-story addition, 63 x 150 ft., to cost about $200,000.

The Contractors Casting & Machine Co., Buffalo, has been merged with the Standard Foundry Co., 743 Hertel Avenue, manufacturer of iron castings, under the latter name.

The Carter Hager Electric Corporation, Buffalo, manufacturer of electric specialties, has filed notice of change of name to the Hertel Electric Corporation.

The United Tractors Corporation, Frankfort, N. Y., is having plans prepared for a new plant to comprise a number of one-story units, each 50 x 300 ft. Lockwood, Greene & Co., 101 Park Avenue, New York, are the engineers.

The Keystone Tool & Metal Parts Corporation, 65 Oak Street, Buffalo, is planning for the installation of new machinery.

The Phoenix Iron & Foundry Co., Phoenix, N. Y., has been incorporated with a capital stock of $25,000 by F. D. McCuen, W. A. Markwick and J. Burns, Syracuse, to manufacture iron and steel castings.

The Stewart Motor Corporation, Buffalo, with plants on Dewey and Delavan avenues, has arranged for a stock issue of $300,000. Expansion plans are now being arranged. T. R. Lippard is president.

W. J. Goade, Batavia, N. Y., manufacturer of hardware specialties, is planning for the erection of an addition to cost $25,000.

The A. J. Deer Co., West Buffalo Street, Hornell, N. Y., manufacturer of coffee mills and other metal specialties, is planning for the erection of a one-story addition, 35 x 60 ft.

The Rochester Foundries, Inc., Rochester, N. Y., recently organized with a capital stock of $52,000, is completing negotiations for the purchase of the property of F. L. Heughes & Co., 190 South Avenue, heretofore devoted to the production of structural and ornamental steel and iron products. It is proposed to build additions. The new company is headed by L. O. Graves, J. M. Stuhl and J. R. Dunn, 165 Barrington Street.

The Rochester Cutlery Corporation, Rochester, has been incorporated with a capital stock of $125,000 by J. L. Wellington, W. H. Simmons and S. L. Webster to manufacture knives, cutlery, etc.

The American Shading Machine Co., 164 Rano Street, Buffalo, has increased its capital stock from $18,000 to $100,000.

The Brewer-Titchener Corporation, Binghamton, N. Y., manufacturer of automobile hardware, etc., has completed plans for a one and two-story addition, 144 x 200 ft., to cost about $100,000.

The Ingersoll-Rand Co., 11 Broadway, New York, manufacturer of mining machinery, air compressors, etc., is planning for a three-story brick addition to its plant at Painted Post, N. Y., to be used as a foundry. With equipment it is estimated to cost about $500,000.

The Fitzgibbons Boiler Co., Oswego, N. Y., has been incorporated with a capital stock of $100,000 by H. Rowland, W. Craemer and J. Janotta, 17 Battery Place, New York, to manufacture boilers and boiler equipment.

Farrar & Trefts, Inc., Perry and Illinois streets, Buffalo, manufacturer of steam engines, boilers, etc., has increased its capital stock from $400,000 to $2,000,000. The company operates the East Buffalo Iron Works, foot of Milburn Street.

The Binghamton Electric Truck Co., Binghamton, N. Y., recently incorporated with a capital stock of $200,000, is planning for the erection of a plant for the manufacture of trucks and trailers, including a parts and assembling department. The company is headed by F. S. Matthews, 239 Main Street, H. C. Warner and W. H. Riley.

The Catalano-Cocca Safety Gas Fixture Corporation, North Collins, Erie County, N. Y., has been incorporated with a capital stock of $50,000 by P. P., F. P. and J. P. Catalano, to manufacture metal lighting fixtures.

The Board of Managers, State School for Mental Defectives, Rome, N. Y., is having plans prepared for a new central electric light and power plant, to cost about $120,000.

Baltimore

BALTIMORE, April 19.

The Reus Brothers Co., 146 West Mount Royal Avenue, Baltimore, machinist, which will build a new plant, has increased its capital stock from $50,000 to $500,000.

The Airland Motor Co., Inc., 527 North Charles Street, Baltimore, has been incorporated with $25,000 capital stock to manufacture airplanes, automobiles, etc. The incorporators are Eugene I. Rosenfeld, Ferdinand Hechinger and Addye G. Rosenfeld.

The Chesapeake Iron Works, Westport, Baltimore, will build an addition, 58 x 210 ft., to cost $10,000.

An addition, 44 x 100 ft., to cost $5,000, will be built by the C. D. Pruden Corporation, Warner and Dock streets, Baltimore, manufacturer of metal garages etc. It will also erect a two-story office building, 30 x 50 ft., at a cost of $10,000.

The Bartlett Hayward Co., Baltimore, has obtained a controlling interest in the Campbell Architectural Iron Co., Albany, N. Y., and will move the plant to Baltimore, where a new company will be organized under the name of The Campbell Metal Window Co., with a capital stock of $2,100,000. It will be operated by the Bartlett, Hayward Co. as a subsidiary and will manufacture a patent metal window frame.

The Baltimore Tin Stamping & Novelty Co., 7 South Street, Baltimore, has been incorporated with $15,000 capital stock by James W. Tyson, third, Jacob Lindley and E. McClure Rouzer to manufacture metal novelties, etc.

The Coale Muffler & Safety Valve Co., 325 East Oliver Street, Baltimore, will build a one-story machine shop addition, 33 x 42 ft., at a cost of $3,500. Quotations are desired on lathes.

The Consolidated Gas, Electric Light & Power Co., Baltimore, will build a generator house at Race and Leadenhall streets; at a cost of $20,000.

The Elkins Motor Car Co., Mebane, N. C., contemplates constructing a plant and will be in the market for lathes, boring machines, etc. A. B. Elkins is manager.

With $100,000 capital stock the Partridge Tractor Co., Jacksonville, Fla., has been incorporated and is preparing plans for the establishment of works for the maufacture of tractors. W. L. Sharkey is manager.

Plans for the establishment of works for the manufacture of automobile motors are being made by the Red Diamond Motors Co., Atlanta, Ga., recently organized.

The Eagle Stove Works, Rome, Ga., is preparing plans to increase the output.

The Union Shipbuilding Co., Fairfield, Baltimore, has completed plans for a one-story machine shop, 100 x 300 ft., to cost about $100,000.

The Chesapeake Fire Brick Co., Elkton, Md., recently incorporated with a capital of $250,000, is negotiating for the purchase of the plant of the Scott Fertilizer Co., on the Elk River, for the establishment of a refractory manufacturing plant. The building on the site was destroyed by fire last year. George S. Hoell, Colonial Trust Building, Philadelphia, is president and Herbert L. Morris, secretary.

The Centrifugal Engine Co., Wilmington, Del., has been incorporated with a capital stock of $100,000 by Martin E. Smith, A. E. Wallace and Artemas Smith, to maufacture engines and similar machinery.

The Carolina Motors Co., Inc., Charlotte, N. C., recently incorporated with a capital stock of $150,000, will establish an assembling plant in an existing one-story building containing 7500 sq. ft. J. L. Spencer and C. B. Bryant head the company.

The Standard Hardware Co., Norfolk, Va., has been incorporated with a capital of $25,000 by H. W. Dashiell and H. J. Etheridge, to manufacture hardware specialties.

Plans have been completed by the Georgia School of Technology, Atlanta, Ga., for the erection of a two-story mechanical building, 45 x 215 ft., the first floor to be equipped as a machine shop and the second floor for woodworking. It has also arranged for an addition to its foundry. Prof. F. P. Smith is in charge of the Department of Architecture.

The Royal Metalware Co., Denton, N. C., has been incorporated with a capital stock of $50,000 by J. O. Garner, John L. Snyder and associates, to manufacture fireless cookers and other metal products. Offices have been established in the Hankins Building.

The Arundel Corporation, Fidelity Building, Baltimore, operating a shipbuilding plant at Fairfield, has filed notice of dissolution of its subsidiary organization, the Arundel Shipbuilding Co. The plant of the latter will be operated in the name of the parent company.

The Keystone Radiator Works, Baltimore, has inaugurated operations at its recently established works for the manufacture of a new type of seamless tube radiator for automobile service. George E. Switzer heads the company.

The new plant of the Prest-O-Lite Co., Indianapolis, Ind., manufacturer of acetylene apparatus, at Orangeville, Baltimore, is estimated to cost about $100,000, according to plans now prepared. The works will comprise a number of reinforced-concrete buildings. Employment will be given to over 200 for initial operations.

The Simms Motor Co., Atlanta, Ga., has been incorporated with a capital stock of $2,500,000. A site of seven acres has been acquired and a plant with a daily capacity of 100 cars will be built. The officers are: President, Thomas H. Marr, formerly general manager Edward Valve Co., Chicago; vice-president, Jackson H. Simms, formerly of the American Locomotive Co.; vice-president and chief engineer, E. W. Van Duzen, formerly with the Pullman, Columbia, Mitchell-Lewis, Reo and other motor car manufacturers.

Chicago

CHICAGO, April 19.

The railroad strike, anticipated labor troubles in machine shops and foundries, and a chronic shortage of raw materials have all contributed to a noticeable slackening of market activity. The amount of business, consisting principally of orders for one or two machines, which continues to develop in spite of these difficulties, is therefore all the more surprising. While rate of buying which obtained earlier this year has not been maintained, the aggregate of numerous small current purchases is fairly good. Sellers are much concerned over the possibilities of a machinists' strike in Cincinnati, where many of the manufacturers they represent have plants. If persistent rumors are to be credited, concerted action by the machinists will not be confined to that city. A molders' strike is also feared in Central Western industrial centers.

The user of machine tools is not only confronted with the prospect of strikes, but he is hampered by a shortage of men and materials. Otherwise plans for expansion would go ahead without hindrance, as the demand for practically all products in the metal working industry is considerably in excess of the present supply. Many manufacturing consumers of tools are no longer promising definite delivery on their products and others are selling on the basis of prices ruling at time of shipment. The latter policy has been adopted by two prominent printing press manufacturers in the Middle West.

A manufacturer of milling machines recently advanced prices 10 per cent, and there have been scattering raises on other tools. In some quarters a general advance on standard lines is expected to materialize in May.

Shipments in and out of this city have been reduced to almost nothing by the transportation strike. Some dealers are using motor trucks more extensively for delivery in and near Chicago.

The Progress Die Casting Co. has bought a one-story plant, 50 x 130 ft., at 4045 West Kinzie Street, Chicago.

The American Lighting Co., 800 Sibley Street, Chicago, has leased a three-story building, containing 36,000 sq. ft. of floor space, at the southwest corner of Polk and Sibley streets. It manufactures Davis flood lights and allied specialties.

The Flexible Steel Lacing Co., manufacturer of steel belt lacing and lamp guards, 522 South Clinton Street, Chicago, has let a contract for a one and two-story plant, 126 x 260 ft., at 4607-31 Lexington Street, to cost $175,000.

The S. S. Ball-Bearing Mfg. Co., 2948 West Van Buren Street, Chicago, has had plans prepared for a one-story factory, 55 x 103 ft., at Colorado and Cicero avenues, at a cost of $20,000.

George Ecker has let contract for the construction of a two-story automobile machine shop at 144-8 West Van Buren Street, Chicago. Excavation for the shop, which will cost $78,000, has begun.

The Elliott Foundry & Machine Works, 1921 South Fairfield Avenue, Chicago, has let contract for the erection of a one-story foundry, 46 x 250 ft., at 3311 South Ridgeway Avenue, to cost $30,000.

The Jackson Auto Radiator Works, 670 West Washington Boulevard, Chicago, will take bids through Ralph W. Ermeling, architect, 155 North Clark Street, on the remodeling of a three-story plant, 50 x 100 ft., at 3133 Cottage Grove Avenue, to cost $15,000.

The Consumers Co., 111 West Washington Street, Chicago, has let contract for the erection of a wagon repair shop, 67 x 169 ft., at 332-38 West Forty-third Street, to cost $25,000.

The Chicago Faucet Co., 2716-2771 Crawford Avenue, Chicago, has let contract for a foundry addition, 54 x 100 ft., to cost $17,000.

S. E. Parker, hoisting machinery, 1800 North Francisco Avenue, Chicago, has awarded contract for a one-story plant, 48 x 120 ft., at 3828-42 North Kilbourn Avenue, to cost $18,000.

The Johnson Hardware Co., Peoria, Ill., will build a furnace pipe factory, 60 x 72 ft., at 916 South Adams Street, at a cost of $16,000.

The Meadows Mfg. Co., manufacturer of agricultural implements, Pontiac, Ill., will remove to Bloomington about the first of May. The new plant includes a 400-ft. one-story machine shop, two other buildings, 75 x 300 ft., a boiler house, foundry and pattern shop.

L. W. Brewer, Jr., Ottawa, Ill., and George W. Mundie, Mendota, Ill., have purchased the Bruner foundry and machine shop, Ottawa. The Bruner foundry dates back 60 years.

The Sterling Foundry Co., Sterling, Ill., has nearly completed improvements to its foundry. A new cupola and an overhead trolley system will soon be ready for use, the latter permitting the opening of additional molding floors.

Frank Loundberg, John Miller, Alfred Bannert and August Swanson, Chicago, have purchased the Fisher foundry, McComb, Ill.

The Mechanics Tool Co., Twenty-third Avenue and Seventh Street, Rockford, Ill., has been incorporated with $300,000 capital stock. It is a reorganization of the Mechanics Specialty Co., which went out of business some time ago, and is now engaged in the manufacture of wrenches.

hammers, chisels and other small tools. Oscar Swangren is secretary.

The Griffin Wheel Co. has commenced the construction of a $1,000,000 foundry at Ninth Avenue and Twenty-eighth Street, Council Bluffs, Iowa. The building will be 352 x 409 ft. and is expected to be completed early in the fall.

The Chicago Steel & Wire Co., 103d Street and Torrence Avenue, is having plans prepared for a one-story foundry addition, to cost about $100,000, including equipment.

The Albaugh-Dover Mfg. Co., 2100 South Dearborn Street, Chicago, manufacturer of cut gears, etc., has completed plans for a one and two-story machine shop, 60 x 175 ft., to cost about $40,000. Hyde & Brown, 8 South Dearborn Street, are the architects.

The Pan Motor Co., St. Cloud, Minn., manufacturer of automobiles, has increased its capital stock from $5,000,000 to $7,000,000.

The Chicago Steel Foundry Co., 3720 South Kedzie Avenue, Chicago, is having plans prepared for a one-story addition.

The United Iron Works, Inc., Kansas City, Mo., has increased its capital stock from $2,500,000 to $4,000,000.

The Nash Motor Car Co., Kenosha, Wis., has arranged for the erection of a four-story service and repair building, 80 x 140 ft., at Cedar Rapids, Iowa, to cost about $300,000.

The Fort Dearborn Mfg. Co., Sterling, Ill., manufacturer of sheet metal products, has awarded contract to the H. D. Morcland Co., 3701 Sheffield Avenue, Chicago, for a one-story addition, 100 x 120 ft., in the Rock Falls district.

The International Harvester Co., Chicago, is considering plans for the erection of an addition to its plant at Canton, Ill.

The Northwestern Barb Wire Co., Sterling, Ill., will make extensions and improvements in its plant to cost about $50,000.

Freyn, Brassert & Co., engineers, Chicago, have completed the erection of a brick and steel plant for the Grip Nut Co. at Fifty-ninth Street and Western Avenue. The main building is 50 x 300 ft. and is served by a 10-ton, 46-ft. span Whiting crane. The saw-tooth section of the building is 50 x 300 ft., divided into two 25-ft. span saw-tooth sections. The annex of the building is 40 x 70 ft., two stories, the first story to be used as a machine shop and the second story as general offices. The boiler house equipment consists of two Kewanee boilers which furnish steam for the annex and also for a hot-air system in the saw-tooth section. Particular attention has been paid to lighting, heating and ventilation.

Cleveland

CLEVELAND, April 19.

The machine tool market shows very little change compared with the past few weeks. A fair volume of business is coming out almost entirely in single machines, but there is a noticeable disposition among manufacturers to buy only machinery that is urgently needed. This conservative attitude has probably resulted from the credit situation, uncertainty about the future, present high prices and long delayed deliveries. Slow deliveries are doubtless an important factor also, as some inquiries are not resulting in orders when it is found that early deliveries cannot be secured. On the other hand, some orders for machinery are being taken for delivery early in 1921. The railroad strike had some effect on orders the past week, causing delay in placing business previously pending.

Forging machinery is in good demand and inquiries covering several round lots are pending from companies making automobile forgings. Manufacturers of conveying equipment, including hoists and shop tractors and trucks, report a heavy demand for their products.

Local machinery houses are receiving inquiries from the American Chain Co., Bridgeport, for two 1200-lb. and one 1800-lb. board drop hammers, four presses, one upsetting machine, one bulldozer for 4-in. stock, and one hack saw for cutting up to 8 in. The Holt Mfg. Co., Peoria, Ill., is inquiring for four horizontal and two vertical milling machines. The Manley Mfg. Co., York, Pa., is inquiring for a combination punching and shearing machine, capable of shearing 7-in. channels.

The Kelley Reamer Co., Cleveland, is erecting a new plant near that of the U. S. Copper Products Co. on Ridge Road. It will be a one-story, 60 x 200 ft., with a second story over the offices to be used as a drafting room. The new plant will increase the company's capacity 30 per cent, and will be ready for occupancy about June 15.

The Enamel Products Co., Elyria, Ohio, will make extensions to its plant, including a 60-ft. addition to its tank shop, the erection of a machine shop and laboratory and install a large sand blast plant.

The Columbia Steel Co., Elyria, Ohio, will build an addition to its plant, about doubling its present cold rolled steel capacity.

The Miller Tire & Rubber Co., Akron, Ohio, will enlarge its plant by the erection of three buildings at an estimated cost of over $800,000.

The Mansfield Tool & Machine Co., Mansfield, Ohio, has been incorporated with a capital stock of $25,000 and will succeed the Mansfield Specialty & Machine Co.

The M & N Drawn Steel Co., Erie, Pa., which was recently organized and will erect a plant for the manufacture of cold drawn steel, has elected Pierre A. Miner, president; Harry L. Morse, vice-president; Walter B. Offerle, treasurer, and J. B. Offerle, secretary and assistant treasurer.

The Mackey Truck & Tractor Co., Ravenna, Ohio, will shortly begin the erection of the first unit of a plant. W. H. Fraser is general manager.

The Edward N. Riddle Co., Toledo, Ohio, maker of electric light fixtures, has acquired an existing building which it will remodel for manufacturing purposes.

The Willys Corporation has acquired a site at Fostoria, Ohio, including a factory building, and plans to erect other structures to be used as a branch of the Toledo Auto Lite Co., an allied interest.

The Ashland Tire & Rubber Co., Ashland, Ohio, has placed a contract for the erection of a factory, 100 x 120 ft.

The Gause Mfg. Co., now located at Elkhart, Ind., will build a factory, 35 x 200 ft., at Montpelier, Ohio, for the manufacture of toys.

It is reported that A. L. White, formerly head of the Lima Locomotive Corporation, Lima, Ohio, has taken an option on a site in that city for works for the manufacture of steam shovels and will move a plant, of which he is now the head at Huntington, Ind., to Lima.

Pittsburgh

PITTSBURGH, April 19.

Inquiry for machine tools is active and considerable business is being closed. The financial situation, however, is holding back many orders that would probably have been placed had the money market been easier. Subsidiaries of the United States Steel Corporation are inquiring for machine tools for local plants and also for works in Youngstown, New Castle and other districts. It is understood that plans are being prepared for additions for which cranes and other equipment will be needed.

Inquiry from the railroads in this district is disappointing, no large lists having come out for some time. The Pennsylvania Lines West are inquiring for a few machine tools for their Columbus and Crestline, Ohio, shops. The demand for cranes is fairly active, several Youngstown steel interests having lately placed orders to cover extensions to existing plants. Most of the new inquiries, however, are for cranes of small capacity.

Machine tool prices are very firm and some types of lathes have been advanced five to 10 per cent. Most makers of standard machines will not promise deliveries within six months and are taking orders subject to an advance of 10 per cent if made on similar types of tools by other makers.

Laughlin & Barney, Wabash Building, Pittsburgh, a new interest, have taken numerous orders recently which include a Bridgeford engine lathe for the National Malleable Castings Co., Sharon, Pa.; eight Betts tire mills, two Bridgeford axle lathes, a 3000-lb. Massillon steam drop hammer, seven 1¼-in. Ajax continuous motion rivet headers, all for the Cambria Steel Co., Johnstown, Pa.; three 30-ton Champion Engineering Co. electric cranes for the General Electric Co., Erie, Pa.; 20-ton electric crane of the same type for the Weirton Steel Co., Weirton, W. Va.; 50-ton electric Champion crane for the Columbus, Ohio, shops of the Pennsylvania Lines West, and a 50-ton Champion electric crane for the Erie Foundry Co., Erie, Pa.

The Chesebrough Mfg. Co., Perth Amboy, N. J., has bought 21 acres at McKees Rocks, Pittsburgh, on which it will build a factory for the manufacture of vaseline, etc. It will be in the market for considerable equipment.

The Pittsburgh Mining Machinery Co., Pittsburgh, recently chartered, will increase its capital stock from $100,000 to $250,000 and it is reported will build a new plant in this district.

The Central Railway Signal Co., First National Bank Building, Pittsburgh, will not build new works at Versailles, Pa., as reported. The plant was recently damaged by fire and the company will only rebuild the burned portions. It will not be in the market for any equipment.

The Keystone Co., Beaver Falls, Pa., is erecting additions to its plant involving an outlay of about $200,000, which include an electric steel foundry, 80 x 120 ft., and an addition to the machine shop, 80 x 110 ft. It also contemplates the erection of a restaurant and welfare room for its employees and an extension to its office, 85 x 110 ft.

The Reihl-Johnson Mfg. Co., Pittsburgh, has been organized to make iron and steel specialties for marine service and will also operate a general repair plant on Third Avenue.

The Allegheny Motor Car Co., Pittsburgh, has filed plans for a two-story service and repair works at 102-08 North Avenue, to cost about $60,000.

The South Hills Hardware Co., Mount Lebanon, Pa., has been incorporated in Delaware with a capital stock of $150,000 by Isaiah Whitehead, Mount Lebanon; Jules E. Roussel, Dormant; and August Baecker, Pittsburgh, to manufacture hardware specialties.

The Whitaker-Glessner Co., Wheeling, W. Va., manufacturer of corrugated iron specialties, steel products, etc., has increased its capital stock from $7,000,000 to $60,000,000. It is considering plans for expansion at its local works as well as at the plants at Beach Bottom and Portsmouth, Ohio.

The Virginian Power Co., Charleston, W. Va., is planning for extensions and improvements to cost about $350,000. The capacity of the electric power plant at Cabin Creek will be increased.

The Sistersville Tank & Boiler Works, Sistersville, W. Va., has increased its capital stock from $100,000 to $200,000.

The National Automobile Co., Uniontown, Pa., is planning for the erection of a four-story service and repair building, 100 x 100 ft., at Morgantown and West Fayette streets, to cost about $175,000.

The Sterling Coal Co., Cecil, W. Va., is planning to rebuild its tipple and power plant, recently destroyed with loss estimated at $50,000.

The Fibrated Products Co., Charleston, W. Va., recently incorporated with a capital stock of $100,000, has closed negotiations with the Charleston Industrial Corporation for the purchase of a section of the former works of the Government at Nitro, near Charleston. The new plant will manufacture roofing specialties and will be equipped to give employment to about 100 persons for initial operations. Charles J. Ruebling and Fred E. Lang head the company.

Machinery to cost about $40,000 will be purchased by the Peacock Coal Co., Clarksburg, W. Va., recently incorporated with a capital stock of $50,000, for installation at its local coal properties. Olandus West is president and Paul Robinson, treasurer.

The Griffith-Foster-Rodes Co., Charleston, W. Va., has been incorporated with a capital stock of $10,000 by George M. Griffith, W. A. Foster and F. S. Rodes to manufacture metal products.

Cincinnati

CINCINNATI, April 19.

Orders for machine tools the past week show a slight falling off, compared with the week previous, due in part to conditions caused by the railroad strike. Export inquiries continue and a number of manufacturers have booked orders for engine lathes and drill presses for Spain, South America and Japan. The Pennsylvania and New York Central lines have purchased a number of tools from Indianapolis manufacturers and the New York Central has a small list out in this city. So far as can be learned none of the tools on the list issued by the Chicago, Burlington & Quincy has been placed, though many manufacturers have made quotations. Local machine tool manufacturers and founders have been somewhat handicapped the past week by the railroad strike, but have not yet been forced to curtail operations. No new developments have taken place in the labor situation and manufacturers are determined to stand firm in refusing to grant the men's demands. The collapse of the railroad strike and the fact that public opinion is very decidedly against strikes of any kind at this time will, it is believed, have a strong bearing on the action to be taken by the machinists' union of this city. The feeling is becoming more general that in some way a walk-out on May 1 will be avoided.

The Safe Cabinet Co., Marietta, Ohio, has taken over the entire plant of the Victor Safe & Lock Co., Norwood, Ohio, and will operate it in conjunction with the Marietta factory. It is understood that the Safe Cabinet Co. will increase its capitalization to $10,000,000 and that the capacity of the Norwood plant will be doubled.

The Edna Brass Mfg. Co., Reading Road, Cincinnati, has awarded the general contract for an addition to its plant to the M. Marcus Building Co., at a cost of about $20,000.

The Ohlen-Bishop Co., Columbus, Ohio, manufacturer of mill and hand saws and kindred tools, is offering a new issue of $400,000 of 7 per cent accumulated preferred stock. The proceeds will be used for additions to take care of its rapidly increasing business.

The Cooper Storage Battery Co., Madisonville, Ohio, has awarded contract to the Austin Co., Cleveland, for the construction of an addition, two stories, 80 x 100 ft., work to start immediately. The company has plans under way for another addition of the same dimensions, which will not be commenced until the one under contract is completed.

Fire on April 14 destroyed the three-story building at Third and Rich streets, Columbus, Ohio, occupied by the Standard Sanitary Mfg. Co. The loss is estimated at about $100,000.

The Atchison Die & Tool Co., North Fourth Street, Columbus, is building an addition to cost $17,000. M. D. Hayes has the contract.

The Marshall-Smith Tool Co., Dayton, Ohio, has increased its capital stock from $10,000 to $50,000 and it is understood plans the purchase of additional machinery and a general expansion of the business. In addition to making tools, other lines of manufacture are contemplated.

The National Cash Register Co., Dayton, has taken out a permit for the erection of a new factory on South Main and K streets, to cost approximately $50,000. It is understood construction will start immediately.

The Xenia Foundry & Machine Co., Xenia, Ohio, has awarded contract for its new foundry on North West Street to Jeffries & Fudge. Construction will begin immediately.

The Maxwell Motor Co., Dayton, will operate its Leo Street works for the manufacture of automobile bodies. It has been used for making axles and motors. The Third Street factory will make closed bodies exclusively.

The Weisman Mfg. Co., Dayton, has been incorporated with a captial stock of $25,000 to manufacture a safety guard for punch presses, the invention of Mr. Weisman.

The manufacturing rights of the Champion kerosene burner now being manufactured by the Champion Kerosene Burner Co., Kenton, Ohio, have been sold to Henderson & Durbin, Lima, Ohio, who will continue the manufacture of the burner in the plant at that place.

Detroit

DETROIT, April 19.

The Stroh Castings Co., 22 Chene Street, Detroit, is taking bids for a two-story addition at Chene and Gusin streets. Edward R. Stroh is president.

The Detroit Twist Drill Co., Fort Street and Fourteenth Avenue, Detroit, has taken bids for the erection of its proposed three-story brick and steel addition, 100 x 112 ft., to cost about $60,000.

The Truscon Steel Co., Detroit, manufacturer of structural pressed steel buildings, steel sash, etc., has arranged for a preferred stock issue to bring its total outstanding issue to $2,500,000.

The Walcott Lathe Co., Calhoun Street, Detroit, is having plans prepared for a two-story, brick, steel and concrete addition, 60 x 150 ft., to be equipped as a drop forge plant. The extension will cost about $150,000 including equipment. D. G. Kimball is manager.

The Detroit Weatherproof Body Co., Pontiac, Mich., manufacturer of automobile bodies, has awarded contract to Grotton Brothers, Lansing, for a three-story and basement plant, 70 x 150 ft., at Corunna, Mich.

The Automobile Crank Shaft Corporation, 192 Piquette Avenue, Detroit, has completed arrangements for a one-story plant, 40 x 165 ft., to cost about $25,000.

The American Steel & Wire Co., 308 South La Salle Street, Chicago, is completing plans for the construction of an addition and improvements to its works at Bessemer, Mich., estimated to cost in excess of $500,000.

The Bay City Foundry & Machine Co., Bay City, Mich., whose plant was damaged by fire with a loss of about $40,000, will rebuild immediately.

The Lakeside Foundry Co., Detroit, has increased its production 50 per cent in the last year, due to enlarged manufacturing facilities. Its capitalization has just been increased from $40,000 to $120,000. The officers are: William Blanck, president; A. Russel Keys, vice-president and

general manager; Edward Stephens, treasurer, and John F. Keys, secretary.

The Flint Foundry Co., Marshall, Mich., is planning for the erection of an addition, 80 x 120 ft., to cost in excess of $60,000.

The Shaw-Walker Co., 439 Western Avenue, Muskegon, Mich., manufacturer of metal filing equipment, etc., has awarded contract to the Rosenthal Cornell Co., 80 East Jackson Boulevard, Chicago, for an addition, 30 x 90 ft., to cost about $200,000, including equipment.

The L. O. Gordon Mfg. Co., Muskegon, Mich., manufacturer of automobile parts, has awarded contract to Brown & Buckley, 232 Standard Street, for a one-story addition, 50 x 130 ft., to cost $25,000.

The American Furnace & Foundry Co., Milan, Mich., has completed plans for a one-story, brick and steel foundry, 75 x 200 ft., to cost about $200,000.

W. R. Mathews & Son, founders and machinists, St. Joseph, Mich., have incorporated under the style of the Advance Foundry Co., with $20,000 capital stock.

The Gerline Brass Foundry Co., Kalamazoo, Mich., has increased its capital stock from $20,000 to $100,000.

The Kalamazoo Blow Pipe Co., Kalamazoo, Mich., has been incorporated with $10,000 capital stock by Homer F. Brundage, Harry S. Baird and Ray O. Brundage.

St. Louis

ST. LOUIS, April 19.

The Fulton Iron Works, 1259 Delaware Street, St. Louis, has awarded contract to the Fruin & Colnon Construction Co., Merchant-Laclede Building, for the erection of its one-story addition to cost about $100,000, including equipment.

The Huckabee Tractors Co., Jonesboro, Ark., recently organized, is arranging for the erection of a plant for the manufacture of farm tractors and has acquired a site of about 25 acres. Eugene Sanders is president.

The Hannibal Rubber Co., Hannibal, Mo., has awarded contract to Burgher Brothers for a new plant, 80 x 200 ft., for the manufacture of cord and fabric tires. With machinery it is estimated to cost about $150,000. W. J. Richards, Hannibal Trust Building, is president.

The O. K. Welding & Machine Co., Henryetta, Okla., recently organized with a capital stock of $75,000, has completed plans for a one-story machine shop, 50 x 150 ft., to cost about $15,000, and one-story foundry, 50 x 70 ft. Earl J. Baker heads the company. C. W. Fisher, McAlester, Okla., is the architect.

A machine shop to handle the work of the Chicago Mill & Lumber Co. and the Blytheville, Leachville & Arkansas Southern Railroad will be equipped at once at Blytheville, Ark.

The St. Louis Felling Machine Co., St. Louis, will erect an addition to its plant at 3763 Forest Park Boulevard.

The Long Staple Cotton Gin Mfg. Co., Helena, Okla., will spend about $50,000 for equipment for the manufacture of cotton gin machinery.

The Lone Wolf Oil & Refining Co., Chickasha, Okla., will equip a $300,000 refinery. T. S. Hendrick is president.

The Crunden-Martin Mfg. Co., St. Louis, will equip a plant to cost about $500,000 for the manufacture of enamel ware and install automatic machinery. Galvanized ware will also be manufactured.

Knight's Scientific Gravity Gauge Co., Tulsa, Okla., R. E. Knight and others interested, will equip a plant to manufacture gravity gages.

The Premier Tire & Rubber Co., Kansas City, Mo., Grover Joyce, president, has increased its capital stock from $300,000 to $1,500,000 and will install equipment for the manufacture of rubber products.

Milwaukee

MILWAUKEE, April 19.

The strike of union switchmen at Milwaukee and similar conditions in other industrial centers have created the most unfavorable situation regarding deliveries of machine tools and other commodities that local manufacturers have ever known. New business is being booked at a satisfactory rate, with Central Western shops the best buyers. Eastern shops have lessened their requirements to some extent, but Pacific Coast buyers continue to offer a large volume of business. Makers of power plant, pumping and paper mill equipment have increased their requirements, but the automotive industries remain the most active purchasers.

The Menominee Motor Truck Co., Menominee, Mich., which was acquired some time ago by members of the Four Wheel Drive Auto Co., Clintonville, Wis., will move its plant and equipment to Clintonville, the Common Council having provided a bonus of $8,000 for a site. A new group of buildings will be erected at an estimated initial cost of $150,000 and additional equipment will be purchased within a short time. James A. Bell is secretary and general manager, with headquarters for the present at Menominee.

The Wisconsin Iron & Wire Works, 1660 Booth Street, Milwaukee, has broken ground for a one-story brick and concrete addition, 76 x 100 ft., which will cost about $45,000 with equipment. E. A. Ernest is vice-president and general manager.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., manufacturer of pumping engines, has purchased a vertical boring mill from the Gisholt Machine Co., Madison, and is buying other equipment from time to time to meet growing production requirements.

The A. H. Stange Co., Merrill, Wis., lumber manufacturer, is contemplating the erection of a new saw and planing mill at Eagle River, Wis. The investment probably will be about $100,000.

The Evinrude Motor Co., 279 Walker Street, Milwaukee, manufacturer of motors for rowboats, canoes and similar craft, will undertake work within a short time on the new plant projected prior to the war but deferred until now because of unfavorable conditions. The site is at Twenty-seventh and Hopkins streets, and an expenditure of about $375,000 in new buildings and equipment is contemplated. C. J. Meyer is president.

The Milwaukee Die & Tool Co., Milwaukee, has been formed with a capital stock of $25,000 to manufacture tools, dies, jigs, fixtures, etc. The incorporators are Albert C. Rudiger and Arthur Julien, 404 Enterprise Building.

The Vollrath Co., Sheboygan, Wis., manufacturer of enameled ware, has let contract to Westinghouse, Church, Kerr & Co., New York, for the erection of a new steam generating plant costing about $75,000. Most of the equipment has been contracted for.

The Chevrolet Motor Co., Detroit, will build a three-story brick and concrete sales and service building, 65 x 165 ft., at Eleventh Street and Grand Avenue, Milwaukee, at an estimated cost of $125,000. One floor will be equipped for machine and repair work. Walter Lochen, Plankinton Arcade, is manager of the Milwaukee branch.

The Wentink Mfg. Co., Menasha, Wis., has engaged architects to prepare plans for a new plant costing $100,000 equipped, for the production of filter mass, car movers and other mechanical appliances, designed mainly for paper and pulp mills. It was established four years ago in leased quarters. William Wentink is president and general manager.

The Snap-On Wrench Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture general mechanical tools. The incorporators are represented by J. H. Marshutz, attorney, 120 Wisconsin Street.

N. Nissen, Kenosha, Wis., is organizing a $25,000 corporation to manufacture a line of automotive accessories and supplies which he has invented and patented. John F. Kuehne, attorney, is in charge of organization work.

The McCord Mfg. Co., Chicago and Detroit, which recently acquired the Racine Mfg. Co., Racine, Wis., manufacturer of high grade automobile bodies, will erect a four-story brick and mill addition, 80 x 120 ft., costing about $150,000, for sheet-metal working, forging, etc. The architect is Edmund B. Funston, Racine. C. F. Brandt is manager of the Racine works.

The Wisconsin-Oakland Co., 525 Jefferson Street, Milwaukee, has awarded contract for a three-story sales and service building, 100 x 120 ft., on Jackson Street, between Mason and Oneida streets. It will cost $120,000. The architect is A. C. Eschweiler, 141 Wisconsin Street.

The Diamond Match Co., Oshkosh, Wis., will build a two-story addition to its plant, 66 x 360 ft., of brick and steel, to cost about $250,000. It will be used largely for storage purposes, and will be equipped with steel conveyors. C. A. Lyneis is supervising engineer.

California

SAN FRANCISCO, April 13.

The Acme Gas Engine Co., San Francisco, will install several new machines in its new plant at 163 Main Street, which it will purchase as soon as the ground floor layout is completed.

A portion of the building to be vacated by the Acme Gas Engine Co., San Francisco, has been leased to Bannon, Bodison & MacIntyre, Inc., 41 Drumm Street, which will install

additional machinery for the manufacture of conveying, elevating and transmission machinery. The Federal Sign System Electric Co., New Montgomery Street, has also leased space and will install machinery to manufacture electric signs. The remaining space will be occupied by the Kennedy Valve Mfg. Co., Rialto Building.

The National Radio Co., San Francisco, will erect a two-story plant 95 x 245 on Twentieth Street, near Folsom, at a cost of $65,000, for the manufacture of wireless and radio equipment.

The branch plant of the Main Iron Works at 159 Spear Street has been moved to the main plant at Sixteenth and Daggett streets.

The Campo Tractors, Inc., Stockton, Cal., has purchased a tract of land and will erect a building within 60 days at a cost of $40,000. The equipment will cost about $75,000.

The Moreland Motor Truck Co., Los Angeles, is planning for the early occupancy of its new plant at Burbank, Cal., which has been in course of construction for some months. The present works will be removed to the new location and a large quantity of additional machinery installed. The new site totals about 27 acres and the initial plant will provide a manufacturing space of about 136,000 sq. ft. The entire project is estimated to cost about $2,000,000.

The W. S. Ray Mfg. Co., 29 Spear Street, San Francisco, manufacturer of stoves, has filed plans for a one-story addition to its plant at Milton and Bosworth streets, to cost about $30,000. It will be equipped for general metal working.

The Baird-Bailhache Co., 478 Sutter Street, San Francisco, manufacturer of gas heaters, etc., has had plans prepared for a one-story building at Twenty-sixth and Adeline streets, Oakland, 106 x 110 ft., to cost about $25,000.

The Standard Oil Co., Los Angeles, has inaugurated construction on an addition to its refinery at El Segundo, Cal. With equipment it is estimated to cost about $2,000,000.

The Coast Tire & Rubber Co., Synd Building, Oakland, Cal., has had plans prepared for a new automobile tire manufacturing plant at East Twelfth Street and Fifteenth Avenue. It is proposed to break ground early in May.

A company has been formed by Gordon L. Freeman, 511 South Wilton Place, and Richard A. Turner, 623 Citizens' National Bank Building, Los Angeles, to manufacture a patented fruit labeling machine invented by Ansel S. Wysong, Los Angeles. A site is now being selected for the works and the initial building with machinery is estimated to cost about $150,000.

The C. H. Crowley Co., 339 Broadway, New York, manufacturer of needles and similar specialties, is considering the establishment of a branch plant in the vicinity of San Francisco and several sites are being considered. It is proposed to inaugurate production in the early fall.

The Southern Pacific Railroad Co., 65 Market Street, San Francisco, is having plans prepared for the erection of a one-story foundry at Sacramento for the manufacture of brass and other metal castings. A spring manufacturing plant will also be established. The structures with equipment will cost about $100,000.

Indianapolis

INDIANAPOLIS, April 19.

The Josam Mfg. Co., Michigan City, Ind., has let contract for an extension to its gray iron foundry. The building will be irregular in shape, 64 x 120 x 24 ft., and will give the company capacity for an additional 10 tons of iron per day.

The International Engineering & Mfg. Co., 204 West Randolph Street, Chicago, has bought 95 acres in Kokomo, Ind., where it will erect a $75,000 plant. The company makes power machinery for farms.

The Whipps Mfg. Co., Carlisle, Ind., has been incorporated with $100,000 capital stock to manufacture farming implements. The directors are James Whipps, Charles L. Whalen and Jason C. Fairhurst.

The Benton Accessories Co., South Bend, Ind., has been incorporated with $125,000 capital stock to manufacture automobile accessories. The directors are Frank L. Sharrer, George Allen and Frank Bierwagen.

The Berry Mfg. Co., Evansville, Ind., has been incorporated with $500,000 capital stock to manufacture measuring devices. The directors are William P. Walsh, William J. Rodgers and Edward E. Meyer.

The Chapman-Price Steel Co., Indianapolis, has increased its capital stock from $200,000 to $1,700,000. The plant, which was recently destroyed by fire, will be rebuilt on a larger scale.

The American Sanitary Lock Corporation, Indianapolis, has been incorporated with $195,000 capital stock to manufacture coin-controlled devices. The directors are Charles S. Raub, Thomas D. Sheerin and Leo Kahn.

The foundries of the Emerson-Brantingham Co., Columbus, Ind., which had been closed since last July, have been reopened.

The Sonora Phonograph Co., New York, will build an assembling plant at Columbus, Ind., adjoining the Grinnell Furniture Co., where the cabinets are made.

The Terre Haute Malleable & Mfg. Co., Terre Haute, Ind., has increased its capital stock from $100,000 to $1,000,000.

The Central South

LOUISVILLE, April 19.

The Preferred Motor Car Co., Louisville, recently incorporated with a capital stock of $2,000,000, is planning for the erection of works for the manufacture of pleasure cars and motor trucks under an interchangeable parts system. The organization is headed by F. W. Young, president; S. C. Bodner, secretary, and Ira C. Koehne, chief engineer, all of Indianapolis, Ind.

The Kentucky Refractories Co., Russell, Ky., has been incorporated in Delaware with a capital stock of $1,500,000 by Clyde K. Turly and D. E. Ernst, Russell, and Vincent R. Coon, Detroit, to manufacture refractory materials.

The Louisiana Motor Car Co., Cedar Grove, La., is planning for the erection of additions and will install considerable new machinery. It recently increased its capital stock from $1,000,000 to $3,000,000.

The Mohrlite Co. of America, Urbana, Ohio, recently incorporated with a capital stock of $300,000 to manufacture electric light reflectors, is planning for the erection of a plant at Nashville, Tenn. R. C. Giles and C. W. Hanchette head the company.

The Kenmont Coal Co., Hamden, Ky., is planning for a number of coal tipples at its different properties.

The Motor Wheel Corporation, Lansing, Mich., has acquired about six acres of land at Monroe, La., and plans the erection of new works to cost about $100,000.

The Istrouma Foundry & Machine Co., Baton Rouge, La., has been incorporated with a capital stock of $10,000 by James F. McCarroll, Holden La., and William F. Bonifay and James A. Durand, Baton Rouge, to manufacture machinery and parts.

The Kentucky Switch & Signal Co., St. Matthews, Ky., has been incorporated with a capital stock of $16,000 by Richard R. and W. E. Scroggan, and R. V. Cheatham, to manufacture signal systems, switches, etc.

The Connors-Weyman Steel Co., Birmingham, Ala., a Delaware corporation, has increased its capital stock from $100,000 to $300,000.

The Hammond-Byrd Iron Co., Birmingham, Ala., has been incorporated in Delaware with capital stock of $500,000 by S. B. Murray, H. L. Morrow and W. K. Clements to manufacture iron and steel products.

Watt & Co., Pineville, Ky., have been incorporated with a capital stock of $15,000 by R. M. Watt, P. E. Nichols and N. R. Patterson to manufacture electrical equipment.

Plans for the establishment of a stove foundry are being prepared by the A. & J. Mfg. Co., Gadsden, Ala. Otto Agricola is president.

Texas

AUSTIN, April 17.

The South Bend Production & Supply Co., Vernon, will equip a plant for manufacturing oil well supplies. The company has a capital stock of $200,000.

The Farmers' Gin Co., Galle, will build a cotton gin at a cost of $20,000. Richard Voss is a stockholder.

The Mack Mfg. Co., Houston, has awarded contract for the erection of a steel and concrete foundry to Tom Tellepsen. A 3-ton electric furnace will be included in the equipment.

The Longview Iron Works, Longview, has been incorporated with a capital stock of $20,000. The incorporators are Guy, C. M. and W. R. C. McKay.

The Whitesboro Oil & Refining Co., Sherman, has awarded contract for the construction of a 2000-bbl. oil refinery to Earl & Beck, St. Louis.

The Pharr Ice & Power Co., Pharr, has purchased the electric light and power plant of the Pharr Mill & Elevator Co. It will install additional equipment and extend the transmission lines.

The Pacific Northwest

SEATTLE, April 13.

Manufacturers of road machinery state that the demand for this equipment is unprecedented and despite the high cost of road work the State and counties have programs for new construction that will run into millions of dollars. The call for all kinds of canning equipment, packing machinery and refrigerating equipment is also extremely active. Electrical equipment is showing renewed demand with the development of municipal extensions to light and power plants.

The car shortage which has hampered the lumber industry for many months is disappearing. The persistent demand is keeping the lumber plants operating to capacity.

The Grays Harbor Lumber Co., Hoquiam, Wash., is completing plans for a sawmill which will have daily capacity of 1,100,000 ft. It also plans the establishment of a door factory, and later a furniture factory. A power plant will be erected to furnish power to all of the company's industries.

The Novelty Ornamental Iron & Wire Works, Seattle, will erect a new factory to cost $10,000, exclusive of equipment. New machinery will be installed.

The Diamond Match Co., Spokane, has purchased timber holdings and will erect two sawmills. One plant will be built at Ruby at a cost of $30,000, and another near Spokane to cost $70,000.

The North Fork Lumber Co., Vancouver, Wash., will erect a sawmill and cut-up plant at Woodland. The company is capitalized for $100,000.

Fredericks & Hogberg, Seattle, will erect a new mill with a daily capacity of 50,000 ft. Work will be undertaken immediately.

The Home Specialty Company, Spokane, has been incorporated for $100,000 by R. B. Martin and others and will establish a plant for the manufacture of furniture and toys.

Plans are under way for the irrigation of 50,000 acres near Great Falls, Mont., to cost $3,500,000. Preliminary arrangements have been completed and work will begin shortly. C. F. Green and W. B. Boynton, Great Falls, are interested.

The Astoria-Warrenton Planing Mill Co., Astoria, Ore., has been incorporated for $25,000 and will erect a plant for the manufacture of lumber and planed products.

Canada

TORONTO, April 19.

The Elliott & Whitehall Machine Co. has secured a site in Jackson Park, Galt, Ont., and will erect a factory, construction to be started immediately. The ratepayers of the city passed a by-law granting the company a loan of $20,000.

The Brown Boggs Co., Ltd., Hamilton, Ont., will build additions to its foundry which will more than double the present output. The installation will eventually include a 25-ton traveling crane.

The Canadian Mead-Morrison Co., Welland, Ont., manufacturer of steam, electric and gasoline hoists, dredging machinery, conveyors, etc., is making preparations to extend its plant and increase production.

W. A. Mahoney, architect, 73 Quebec West, Guelph, Ont., has prepared plans for an addition to the foundry at Guelph for the T. Eaton Co., 190 Yonge Street, Toronto, construction to start immediately. Considerable new equipment will be installed.

B. H. Prack, architect and engineer, 50 Bay Street, Toronto, will receive bids at an early date for an addition to the plant of Willys-Overland, Ltd., Weston Road.

Morris Weisdorf, 205 McCaul Street, Toronto, has had plans prepared by B. Swartz, 336 Dundas Street West, for a foundry to cost $6,000.

Wells & Gray, Confederation Life Building, Toronto, have the general contract for an addition to the plant of the Holmes Foundry Co., Sarnia, Ont., to cost $100,000.

Benjamin Gotfredson, president, and Frank H. Joyce, secretary-treasurer American Auto Trimming Co., Ltd., Walkerville, Ont., have formed the Gotfredson-Joyce Corporation, Ltd., to manufacture motor trucks, etc. The Gramm plant at Walkerville has been taken over and is being remodeled to turn out 2½-ton trucks.

The Lion Tire & Rubber Co., Ltd., New Toronto, Ont., recently incorporated, has secured five acres on the Hamilton Highway and will start work immediately on the erection of a factory, the first unit to be 100 x 300 ft., two stories. It will have a capacity of 500 tires and 1000 tubes per day. A large part of the plant will be equipped for the manufacture of cord tires. Among those interested are Messrs. Ridge & McCormish, Akron, Ohio, but the company, whose head office is Toronto, is organized and financed by Toronto business men. The officers are: President, J. H. Greenberg, 20 Grange Avenue, Toronto; vice-president, Amos Tipling, Wingham, Ont.; secretary-treasurer, J. A. Campbell, Toronto.

S. L. Biggs, town clerk, Pembroke, Ont., is receiving bids until May 12 for furnishing and installing a turbine pump and gasoline engine with capacities of 1200 gal. and 800 gal. per minute. J. P. Howe is town engineer.

The B. C. Marine, Ltd., Vancouver, B. C., has increased its capital stock to $1,000,000 and proposes alterations and improvements in its plant, with a view to building ships on an extensive scale.

The board of directors of Canada Foundries & Forgings, Ltd., has decided to proceed at once with an expansion of facilities at its Welland, Ont., plant, which will greatly increase the output of heavy drop forgings. It also contemplates further extensions to meet the growing demands of Canadian automotive industries.

The Lakefield, Ont., power plant was destroyed by fire April 12, with a loss of about $50,000.

OFFICE CHANGES

After May 1, the New York office of the Imperial Brass Mfg. Co., Chicago, will be located in the Longacre Building, suite 605, Forty-second Street and Broadway.

The Sanitary Sewer Basin Co. of Illinois, 549 West Washington Boulevard, Chicago, announces the opening of offices at that address. The company manufactures a patented all cast-iron sewer catch basin and an adjustable noiseless and lock-cover patented manhole. Carl E. Gschwind, formerly in business in Youngstown, Ohio, is affiliated with the company.

The Latrobe Electric Steel Co. has moved its Cleveland office to temporary quarters at 810 Union Building and plans later to open a warehouse in Cleveland. Percy W. Fenner is district sales manager.

W. H. Farrell, president and representative the Bridgeport Screw Co., Bridgeport, Conn., announces the discontinuance of his offices at 501 Fifth Avenue, New York.

The Morse Chain Co., Ithaca, N. Y., has moved its Greensboro, N. C., office to Charlotte, N. C., 404 Commercial Bank Building. George W. Pritchett, Southeastern manager, found this change advisable owing to increase in use of Morse silent chains throughout the textile industry. In the new quarters there will be an exhibit of chain drives in operating order.

The Booth Electric Furnace Co., 53 West Jackson Boulevard, Chicago, changed its address April 20 to 326 West Madison Street, Chicago.

Some of the large rolling mill work which was expected to be built in the United States for plants in the devastated regions in Europe will not materialize; in fact, some provisional contracts have even been canceled. Instead, American designs will be employed, but manufacture will be in selected plants, as in France, according to drawings supplied by at least one American builder. The consideration is thus one covering engineering design and supervision, not on the manufactured product, which not only now carries a high cost but involves heavy transportation costs, besides an added burden to the buyer because of the prevailing rates of exchange.

To instruct its foreign-born employees and members of their families in the fundamentals and to assist them in obtaining citizenship papers, the Standard Tank Construction Co., Masury, Pa., has instituted a school in Americanization which meets every Tuesday and Thursday evening in a plant building. C. D. Elliott, employment supervisor and Frank Wilk, are supervising the program.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	5.00c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 5.00c.
1 to 6 in. x ⅜ to 1 in.	3.52c. to 5.00c.
1 to 6 in. x ¼ to 5/16	3.62c. to 5.00c.
Rods—⅝ and 11/16	3.57c. to 4.80c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 6.25c.
Hoops	5.57c. to 6.25c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 5.00c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 5.00c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 5.35c.
1½ to 2½ in. x ⅛ in.	3.52c. to 5.65c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 5.60c.
1 to 1¼ in. x 3/16 in.	3.52c. to 5.65c.
1 to 1¼ x ⅛ in.	3.57c. to 5.70c.
⅞ x ⅞ x ⅛ in.	3.62c. to 5.75c.
¾ x ⅛ in.	3.67c. to 5.80c.
⅝ x ⅛ in.	4.07c. to 6.60c.
½ x 3/32 in.	5.17c. to 7.30c.
Tees:	
1 x ⅛ in.	3.87c. to 6.00c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 5.90c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 5.70c.
3 in. and larger	3.52c. to 5.05c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	5.00c.
Toe calk, ½ x ⅝ in. and larger	5.75c. to 6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c.
Shafting and Screw Stock:	
Rounds	6.00c. to 7.00c.
Squares, flats and hex	6.50c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00c. to 30.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 5.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	6.62c. to 8.00c.
No. 12	6.67c. to 8.05c.
No. 14	6.72c. to 8.10c.
No. 16	7.82c. to 8.20c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	7.80c. to 8.80c.	—
Nos. 22 and 24	7.85c. to 8.85c.	9.80c.
No. 26	7.90c. to 8.90c.	9.85c.
No. 28	8.00c. to 9.00c.	10.00c.
No. 30	8.10c. to 9.10c.	—

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	8.25c. to 10.00c.
No. 16	8.50c. to 10.25c.
Nos. 18 and 20	8.65c. to 10.40c.
Nos. 22 and 24	8.80c. to 10.55c.
No. 26	8.95c. to 10.70c.
No. 27	9.10c. to 10.85c.
No. 28	9.25c. to 11.00c.
No. 30	9.75c. to 11.50c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
⅛ in. Butt...	—36	—19	¾-1½ in. Butt	—18	+2
¼-3 in. Butt.	—40	—24	2 in. Lap.....	— 9	+9
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	—11	+6
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per lb
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

Base Price	
High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Waste
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb...	10.80	10.55
		90 lb...	10.90	10.65
		100 lb...	11.00	10.75
1C...$15.50	$13.25	IC...	11.25	11.00
1X... 17.75	15.25	IX...	12.25	12.00
1XX... 19.50	17.00	IXX...	13.25	13.00
1XXX... 21.25	18.75	IXXX...	14.25	14.00
1XXXX... 22.75	20.50	IXXXX...	15.25	15.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	65c.
Bar	70c. to 80c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10¼c. to 11¼c.
Sheet zinc, No. 9 base, casks	14c. open 14½c.

Lead and Solder*

American pig lead	10¼c. to 11¼c.
Bar lead	11¼c. to 11¾c.
Solder ½ and ½ guaranteed	43c.
No. 1 solder	40c.
Refined solder	36c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	12¼c. to 12¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 38c

Old Metals

Business is very quiet and prices are unchanged. Dealers' buying prices are as follows:

	Cents Per lb
Copper, heavy and crucible	16.75
Copper, heavy and wire	16.00
Copper, light and bottoms	14.50
Brass, heavy	10.75
Brass, light	8.00
Heavy machine composition	16.00
No. 1 yellow brass turnings	9.75
No. 1 red brass or composition turnings	12.75
Lead, heavy	7.50
Lead, tea	6.00
Zinc	5.50